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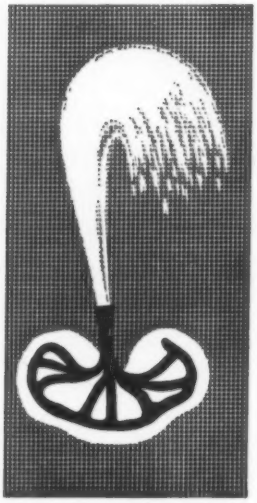

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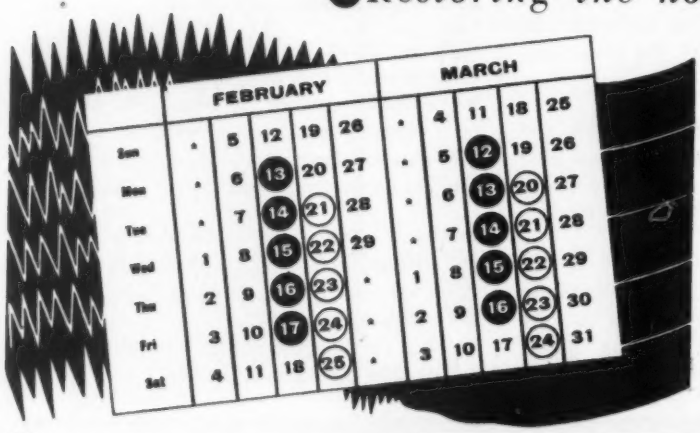

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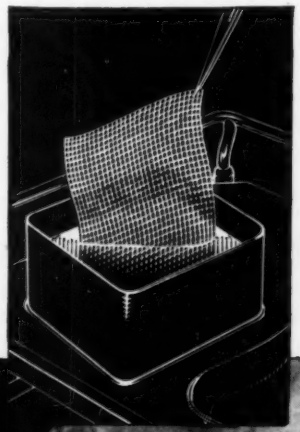

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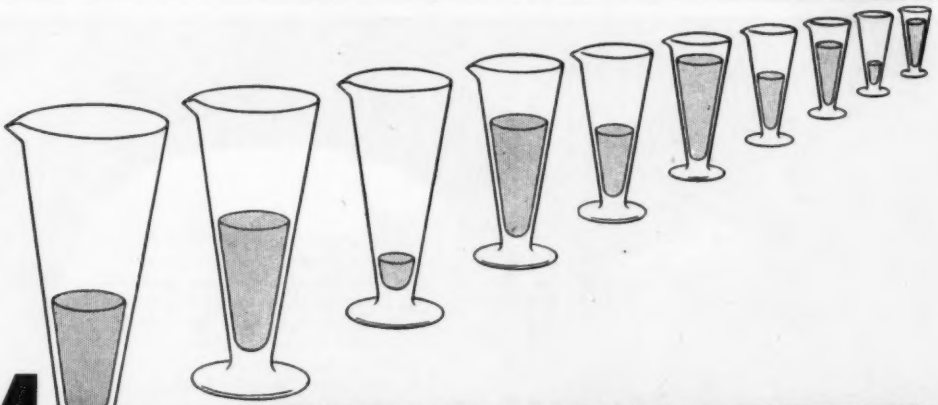

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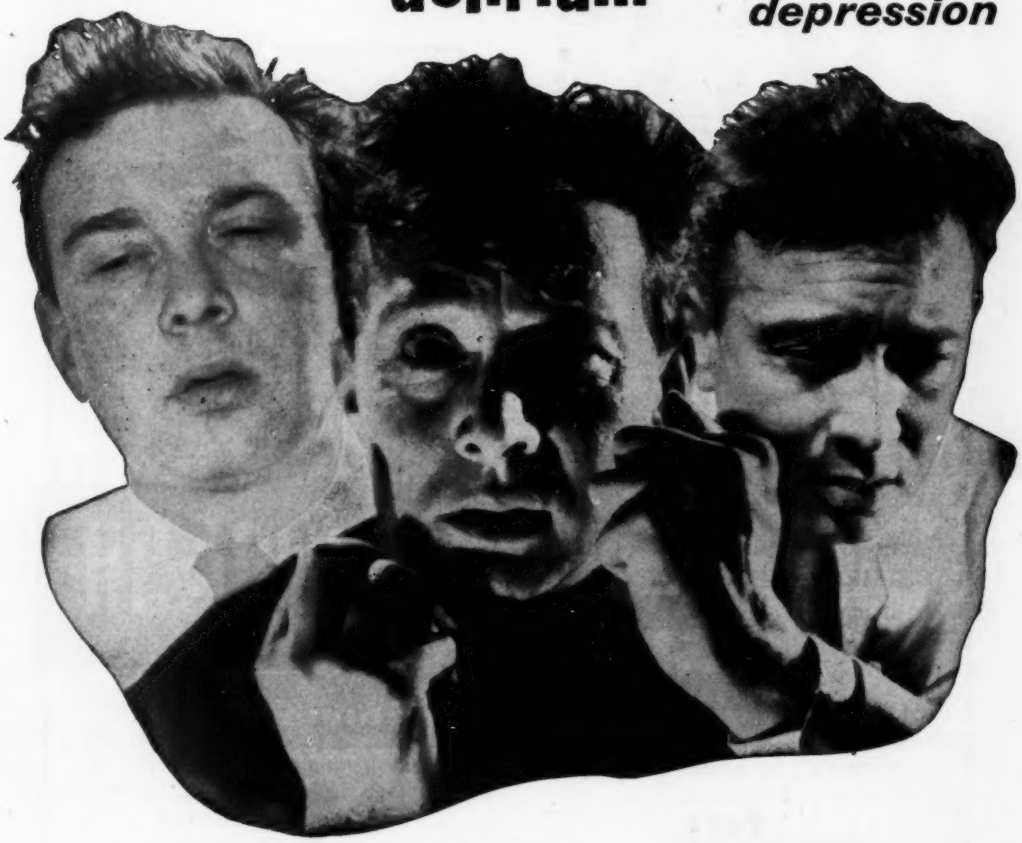

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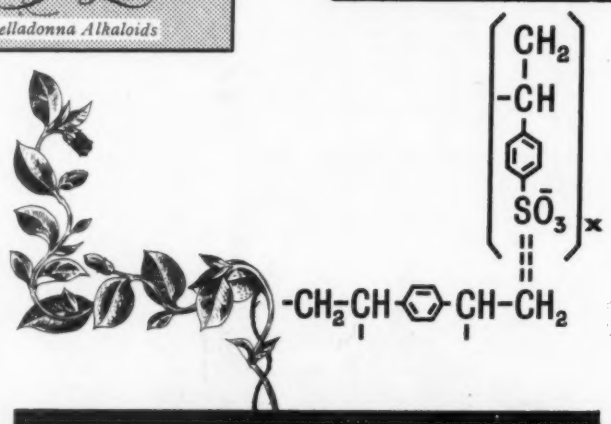

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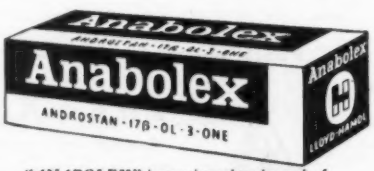

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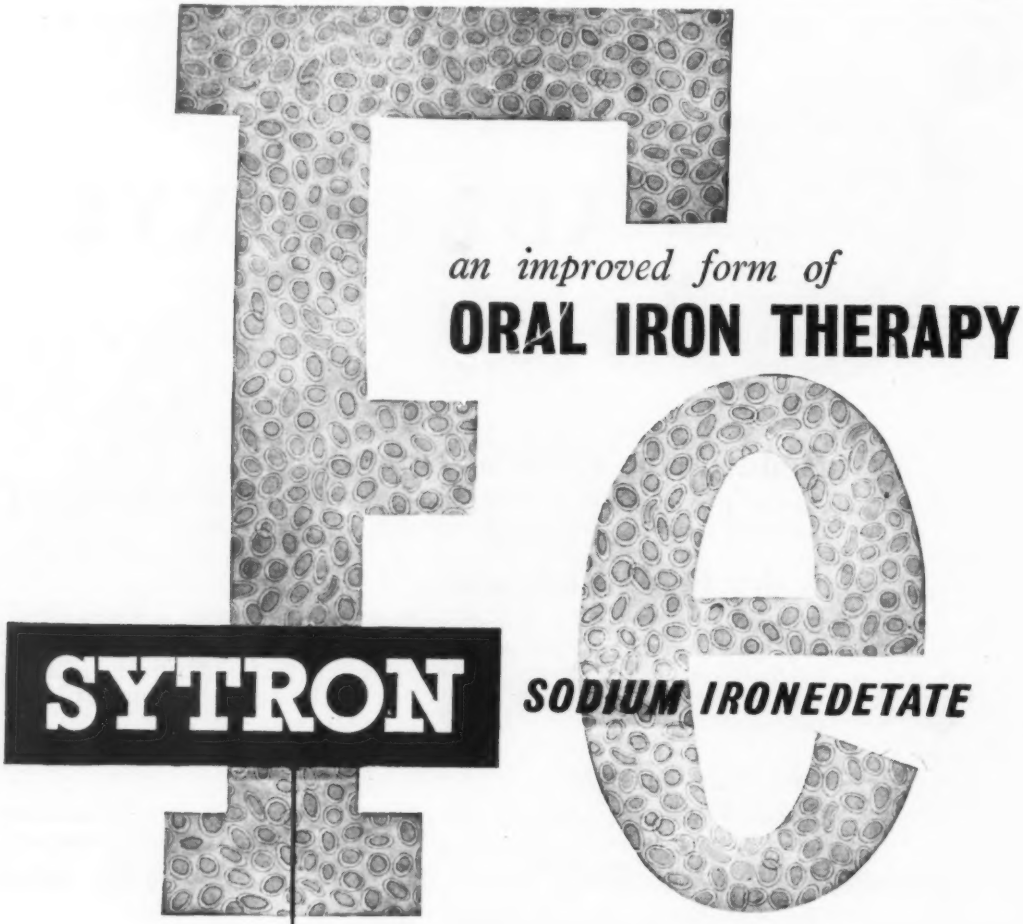

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1. *Amer. J. Obst. Gynec.* (1952) **63**:1361.
2. *Proc. Soc. exp. Biol.* (1953) **84**:491.

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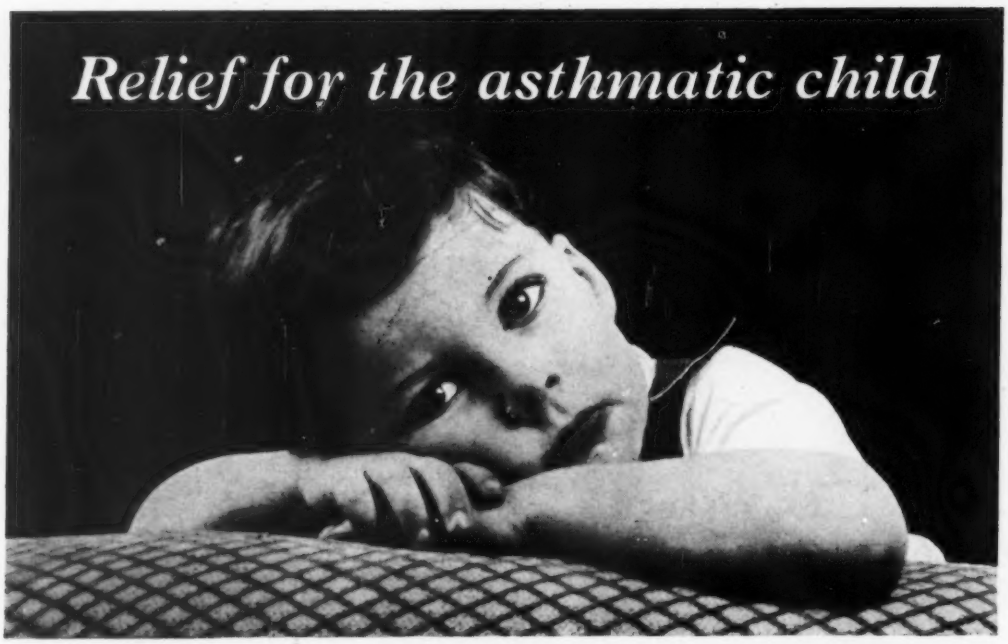

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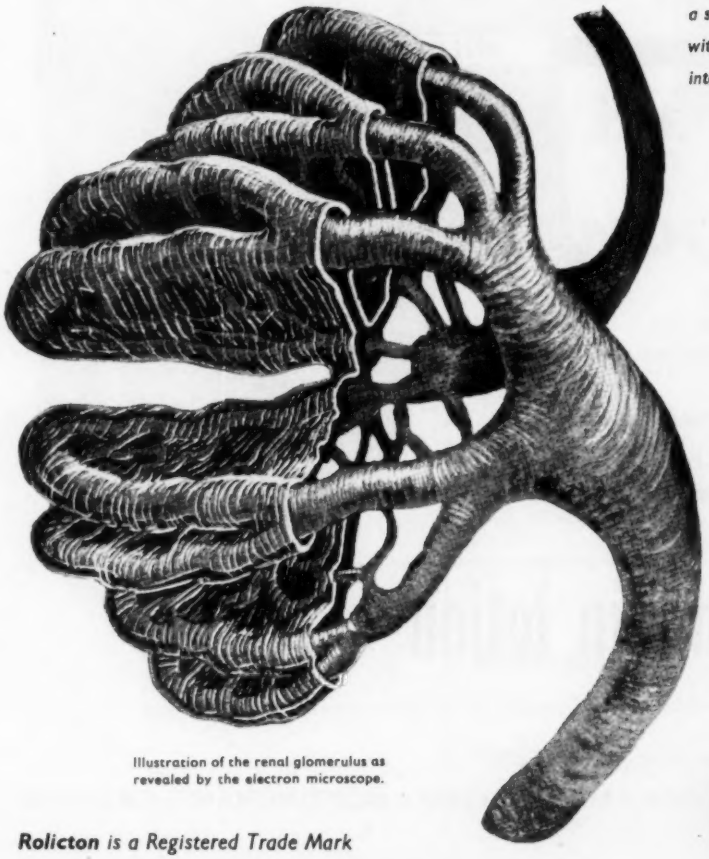
(1958) *Brit. Med. J.*, **1**, 9.



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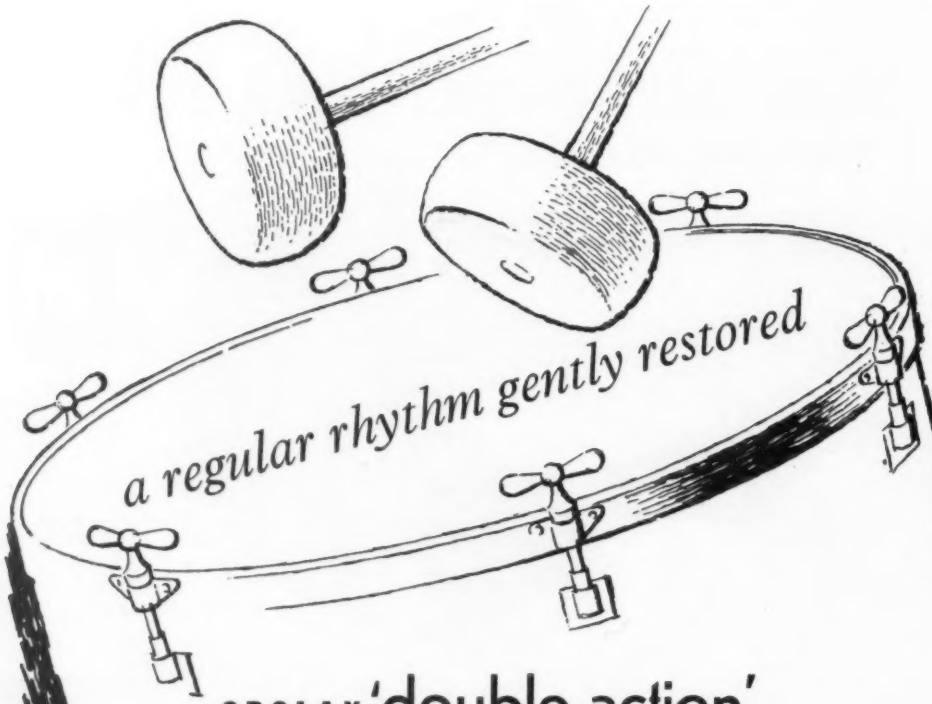

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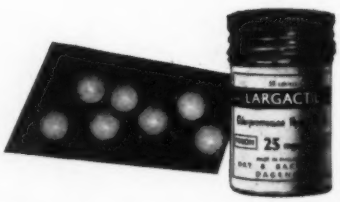

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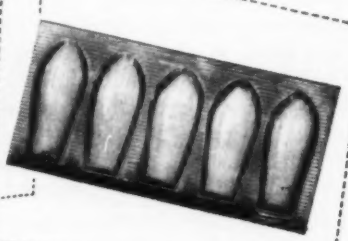

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THE THYROID NODULE *

SELWYN TAYLOR †
M.Ch. Oxon., F.R.C.S.
SURGEON, KING'S COLLEGE HOSPITAL; LECTURER IN SURGERY, POSTGRADUATE MEDICAL SCHOOL OF LONDON

IT is almost twenty-five years since, as a physiology student, I read Harington's (1933) textbook on the thyroid gland, yet on rereading my notes I find little that needs altering after all the intensive research work lavished on this single endocrine gland in the succeeding quarter of a century. There is much, however, to add to this earlier account, and here I want to weave together something old and something new to try and explain why nodules appear in the thyroid gland, their natural history, and how we may hope to diagnose them correctly and treat them rationally. Those of us who still like to be called general surgeons are continually confronted by the patient who harbours a readily palpable thyroid nodule, and our first question must surely be: is this goitre simple, toxic, or malignant? I have a particular interest in simple or non-toxic ones; certainly they are the most common.

The Simple Nodule

Lack of Iodine

Simple goitre is primarily due to failure of the thyroid gland to obtain sufficient iodine to maintain its normal structure and function. In most parts of the world a deficiency of iodine is the commonest cause of a nodule in the thyroid gland of a young person and of multiple nodules in older people. The ancients used burnt sponge and seaweed to treat goitre, which was splendid empiricism because iodine was not discovered until 1811 by the Frenchman Courtois (1813). At that time our fleet was blockading the French coast, and Napoleon could not import the nitrates he required to make gunpowder. His backroom boys therefore devised other means of obtaining nitrates; they used a process involving, at one stage, the admixture of seaweed ash with sulphuric acid in metal vats. It seems that Courtois one day had perhaps added stronger acid than usual, because beautiful violet vapours were seen to arise which proved to be a new element, iodine. Thus Napoleon's gunpowder gave us iodine, just as nuclear fission has given us radioactive iodine.

Soon after Courtois' discovery of the new element Sir Humphry Davy (1814) confirmed the presence of iodine in seaweed and Fyfe (1819) in sponges; and as early as 1816 Dr. William Prout was prescribing potassium iodide for goitre. Some remarkable micro-assays by Chatin (1850–76) put the whole subject on a sound scientific foundation, from which it was unfortunately toppled by some unsatisfactory attempts at preventing goitre with iodine in the French provinces. Thus the way was paved for the infective theory of goitre to gain the ascendant, probably helped by the great interest taken at that time in the work of Pasteur and Koch. However, although this temporarily distracted attention from a low intake of iodine as the cause of thyroid enlargement, it encouraged investigations into those other goitrogenic substances whose presence becomes important in the iodine-deficient areas of the world. In such areas the daily intake of iodine is less than 100 μg., the quantity determined by Curtis and Fertman (1950) as necessary for normal function of the thyroid gland in an adult.

Evolution of Simple Goitre

The natural history of thyroid enlargement in an area of endemic goitre has been carefully documented in the past (Olesen 1924, 1926, 1929, Olesen and Taylor 1926, 1927), especially by public-health workers. In an area of average severity the thyroid appears moderately enlarged in early childhood. This type of enlargement was called by Murray et al. (1948) the Rossetti neck. At the age of 5 years, about a quarter of the boys and a third of the girls may be so affected, and by puberty the incidence is usually at its highest.

Puberty goitre has been regarded as a physiological (McCarrison 1917) rather than a pathological response to lack of iodine because it reflects the great demands made on the gland at this period and may be entirely reversible. I have, however, seen young adults with thyroid nodules who had only spent the first 5–10 years of their lives in an endemic goitre area and had then moved to a district where the intake of iodine was adequate.

After puberty it is usual for the enlarged thyroid gland to diminish in the male but to persist in the female, in whom it usually enlarges a little before each menstrual period and considerably during pregnancy. At the age of 30 nodules have often appeared, and the real problem here is when and why the diffuse hyperplasia of puberty becomes nodular in the third decade and later.

Autoradiographic Studies

In an attempt to gain insight into the processes taking place in nodular goitre we have prepared in the laboratory autoradiographs from well over a hundred patients operated on for simple goitre.

Autoradiography, a technique to which I was first introduced by Brown Dobyns, is ideally suited to the study of goitre because it gives a physiological rather than an anatomical picture of what is going on when the tissues are removed. It consists in exposing a slice of the thyroid gland to a piece of photographic film, which becomes black where the tissues contain radioactive material. Thus it makes possible a comparison of the histology of any area with its capacity to concentrate and bind iodine to protein—in other words, to manufacture thyroid hormone.

The patients investigated were representative of most types of simple goitre, being drawn from those with sporadic goitre in London and others from endemic areas in Southern Ireland who had come to work in London.

Each patient was admitted to hospital and, after a thorough history had been obtained, including details of dietary habits, district where born and bred, and any family incidence of goitre, was given a tracer dose of radioactive iodine. The urine was collected for forty-eight hours and the overall activity of the gland determined by the method of Fraser et al. (1953). Partial thyroidectomy was done, and slices of tissue were cut through whole lobes to get a good overall picture. The tissue was fixed and cut exactly as for ordinary histology, and these giant slices were then put in contact with pieces of X-ray film, which were developed at one, two, and eight days and then compared with the histological sections.

* From a lecture delivered to the section of surgery of the Manchester Medical Society on Dec. 10, 1957.

† In receipt of a grant from the British Empire Cancer Campaign; some of the work described here was done with a grant from the Medical Research Council.

Examination of these autoradiographs at once revealed many interesting features. In diffuse simple goitre the blackening showed a fairly uniform peppering throughout the gland, but in older patients the greater part of the thyroid gland appeared to concentrate no radioactive iodine at all, there being only small discrete foci of blackening. Blackening only takes place in areas where there is iodine-containing colloid. Colloid does not necessarily contain iodine. The features which distinguished those follicles capable of doing this from the others was that the former were small in diameter, with tall cells. Rawson and Starr (1938) showed that increased height of the follicle cells indicated increased stimulation of the thyroid gland. In addition these small active follicles were grouped together in a characteristic way. The diameters of 100 follicles in active and non-active areas were measured in two axes at right-angles to each other. The diameters of the active follicles were not only about a third of those of the inactive ones but also were much more uniform in size (Taylor 1952).

When autoradiographs of the whole series of goitres were examined in conjunction with the histological preparations and case-histories of the patients, it appeared possible to reconstruct the natural history of the disease (Taylor 1953). This evolution of nodular goitre I have divided arbitrarily into five stages, although appreciating that other workers might interpret the results differently.

Stage I is diffuse enlargement of the thyroid gland, which shows increased vascularity, a large uptake of radioiodine, and uniform blackening of the autoradiograph. This is the typical puberty goitre but may persist for years.

Stage II comprises all those thyroid glands which show discrete focal areas of hyperplasia with corresponding blackening of the autoradiograph. There are very few patients in whom all the functioning thyroid tissue is concentrated in a single area; Rawson when shown autoradiographs of this condition, immediately described it very aptly as a toxic nodule in a non-toxic gland. It is fashionable at present to call this a hot nodule in a cold gland, but it must not be forgotten that the patient presents the picture of normal thyroid (euthyroid) function.

Stage III.—Before the next stage in this evolution is described, it is necessary to appreciate the internal architecture of the thyroid gland. The building-blocks from which the gland is constructed are follicles, each being a spherical structure made up of a single layer of cells covered by a basement membrane and a rich network of blood-vessels. Johnson (1953, 1954), by perfusing excised glands with warm saline solution, has split up the connective-tissue planes to show that each 20–40 follicles are bound lightly together to form a lobule, each lobule being supplied by a single artery. This important lobular or " unit " construction was known a century ago but in recent years was doubted, probably because of methods of wax-model reconstruction (Rienhoff 1930) from serial sections which hinted at a branching structure.

It appears from our autoradiographs that these lobules work as single units and become increasingly more hyperplastic and vascular. This stage is typified by disruption with hæmorrhage, which is followed by necrosis, and on the autoradiograph only a rind of active tissue is seen.

Stage IV is the end-result of stage III. The nodule undergoes resolution in one of two ways: either a large lake of colloid fills it and this is found to be free of iodine, or a mass of new follicles grows to supersede it, and again their colloid does not take up radioiodine.

Stage V is the multinodular or pudding-stone goitre, brought about by the continued repetition of the process described above, with the result that most of the nodules are inactive and incapable of metabolising iodine; but among them will be found a few active foci which are currently supplying the body's hormone requirements.

Experimental Goitre

Nature has made some vast experiments in the production of goitre in various parts of the world, and this has stimulated research, such as McCarrison's in the foothills of the Himalayas fifty years ago and Stanbury's (1954) in Argentina. Both McCarrison and Stanbury noted that, with an improved standard of living, more articles of diet were imported into the district and, containing iodine, lessened the incidence of goitre. Thus, in the endemic areas of the world, the poorer the individual the bigger is his goitre.

These great endemics can be imitated in miniature in the laboratory by giving rats a low-iodine diet, where the decreased output of thyroxine by the thyroid gland leads to increased activity of the basophil cells of the anterior lobe of the pituitary gland, with a proportionately increased rate of secretion of thyroid-stimulating hormone (T.S.H.). This enhanced activity of the pituitary gland explains the postmortem observation made by Niépce (1851) that cretins have large pituitary glands.

In my own laboratory we have maintained rats for two years on a low-iodine diet, killing them at intervals and attempting to reproduce the stages in the development of nodular goitre seen in man (Taylor and Poulson 1956). Unfortunately we found that the thyroid gland of rats behaved like a single human thyroid lobule, and hyperplasia was uniform and not focal; we obtained nodules, but they were not hyperplastic. However, it led to an investigation of the individual items in the diet: we found that calcium carbonate, which is a usual constituent of rat diets, is very goitrogenic in young animals on a low-iodine regime (Taylor 1954). This observation correlates well with the fact that in the low-iodine areas of the world, where there is much chalk or limestone, goitre is more common—e.g., Derbyshire. How salutary it is to read the work of Boussingault (1831), who mapped out the goitrous areas of Colombia and related them to the presence of limestone.

Since the nodules in goitre appear to be related to increased secretion of T.S.H., we have been taking excised thyroid glands straight from operating-theatre to laboratory. Tissue slices of nodular and non-nodular tissue have been studied in a Warburg apparatus, but no technique that we have evolved has shown a difference in the responsiveness of the two kinds of tissue to T.S.H. (Taylor and Moffitt 1957). An interesting study by Pitt-Rivers et al. (1957), using chromatography on excised nodules, has disclosed a larger proportion of the precursors of thyroxine, suggesting that the metabolism of iodine in some of these active areas is abnormal.

Treatment

The foregoing account makes it possible to be rational in the treatment of simple nodular goitre. Prevention being better than cure, an adequate daily intake of iodine is the most important single factor and one which can be readily provided by iodising all domestic salt. Puberty goitre and diffuse enlargement of the thyroid gland calls for either gr. 3 of desiccated thyroid or sodium *l*-thyroxine 0·3 mg. by mouth daily. Claims have been made that triiodothyronine 90·0 μg. daily is more effective, but in our hands its only merit has been swiftness of effect. (When hæmorrhage has taken place into a nodule, the blood-serum should be aspirated through a wide-bore needle; usually nothing further is required.) Finally

there is thyroidectomy, which is usually indicated for cosmetic reasons, pressure effects, or suspected malignancy. It is useless to enucleate single nodules; partial resection of both lobes and the isthmus is necessary. When only one lobe is removed, often the patient returns in about five years with enlargement of the opposite lobe.

Since thyroid nodules appear to be due to compensatory hyperplasia, removal of thyroid tissue would deprive the patient even further of an already depleted supply of thyroxine. It is true that nature compensates for this remarkably well, but a careful follow-up of patients after thyroidectomy for simple goitre usually shows a brisk increase in weight and fatiguability—a condition readily treated with small doses of thyroid, which may often be gradually reduced after a year or two. The patient with a solitary hyperfunctioning nodule presents an extreme example of this, often becoming overtly hypothyroid after operation and, if uncorrected, taking at least three months to regain the euthyroid state. The value of thyroid medication in the postoperative period has not been emphasised sufficiently in the past.

The Toxic Nodule

Hyperthyroidism due to a solitary toxic nodule is rare; Plummer (1928), of the Mayo Clinic, first drew attention to it. It is a condition comparable to that described in stage II, the "toxic nodule in a non-toxic gland", but in this case the mass of functioning tissue is so great that the patient is toxic. Hæmorrhage is usual in this type of nodule, and often the result is spontaneous cure of the hyperthyroidism. Most clinicians must have seen the hyperthyroid patient who spontaneously lost all her symptoms. I would go so far as to say that this is a self-limiting form of the disease.

The toxic nodule is the only one which it is completely justifiable to enucleate, the remainder of the gland being left intact. However, the remainder of the gland is atrophic, and its activity is suppressed by the secretion of the toxic nodule. Therefore after operation the patient rapidly becomes hypothyroid and may feel acutely depressed. Thyroid medication should be started in the immediate postoperative period and gradually diminished in the succeeding twelve months.

The Malignant Nodule

The difficulty of deciding when a thyroid nodule is malignant has led to a spate of articles on this subject in recent years; indeed the incidence of malignancy in excised thyroid nodules has been reported at levels varying from 0 to 25% by different workers. Crile (1950) was the first to point out that such figures merely reflect the habits of the surgeon, the cancer-rate depending directly on which patients he chooses for operation. Certainly this greater alertness to the possibility of malignancy in the thyroid nodule must have encouraged many pathologists to take more blocks of tissue and to cut more sections.

Ætiology

Since increased secretion of T.S.H. can lead to focal hyperplasia in the thyroid gland, it seems possible that a continuation of the process might play an important part in producing malignancy. If this is true, thyroid cancer should be commoner in areas of endemic goitre, and evidence has been marshalled in support of this by Doniach (1956). Switzerland, an endemic goitre area with a population a tenth of that of this country, has a death-rate from thyroid cancer almost identical with ours. Furthermore the introduction of iodised salt in Switzerland is beginning to cause a decline in this incidence (Wynder 1952).

A malignant nodule in the thyroid gland has usually a papillary or follicular pattern. Papillary carcinomas tend to occur in the younger patients, are non-encapsulated, grow relatively slowly, and spread typically by the lymphatics. Follicular carcinomas have capsules which enable them to be shelled out from the gland, and their metastases are commonly blood-borne to bones and lungs. Anaplastic carcinoma need not concern us here, because it does not usually present as a nodule.

Diagnosis

The correct diagnosis of malignancy in a thyroid nodule is difficult, but the patient's complaint that all is not well in the neck should not be lightly dismissed. Hardness, fixity, involvement of other structures, especially the recurrent nerve, all point to malignancy, as does involvement of lymph-nodes. Radioiodine has some diagnostic value here because malignant tissue does not usually take it up in the presence of normal thyroid tissue, and thus a careful scan of the patient's neck with a collimated tube, as first described by Dobyns and Lennon (1948) (Taylor and Stewart 1951), may be helpful. If the nodule takes up radioiodine it is unlikely to be malignant. Raymond Greene (1957) has reviewed his experience with this technique.

Treatment

Whenever a nodule is suspected of harbouring papillary carcinoma, the whole lobe in which it lies should be excised, with careful preservation of the recurrent nerve. If any lymph-nodes are involved they should be excised at the same time. When follicular carcinoma is discovered it should never be shelled out, but total thyroidectomy should be done, with preservation of some parathyroid tissue. The object of total thyroidectomy is twofold; it removes the primary tumour; and, if metastases are already present or develop later, they may be amenable to treatment with radioiodine if the thyroid gland is not there to compete for the isotope.

The Prevention of Nodules

When the daily intake of iodine is less than about 100 μg., goitre becomes endemic, more especially where goitrogens, such as calcium, are present in the diet. Goitre brings with it a host of complications: increased incidence of thyroid cancer; probably increased incidence of hyperthyroidism; all the disability caused by pressure on the trachea, great vessels, and œsophagus; and cretinism (*Bulletin of the World Health Organisation* 1953). Because of these complications New Zealand, Switzerland, the United States, Yugoslavia, and Argentina now iodise their salt. The experience of those countries which have had iodised salt for years is the best proof of its advantages.

There are no recorded adverse effects to man of adding 50–100 μg. of iodine to the daily diet. Although such effects have occasionally been claimed they have, on investigation, been shown to be due to some other factor, usually the addition of pharmacological instead of physiological amounts of iodide. Unfortunately iodide added to table salt tends to migrate into the paper or cardboard container; but the use of iodate obviates this. If any person wished to use salt without this addition, it could readily be arranged for such salt to be available on demand.

The cost to this country annually of not iodising salt must be immense if calculated in terms of demands made on the medical services and loss of working time. Why do we not iodise salt? The Medical Research Council recommended it in 1944 and again in 1948. An Order in Council was prepared in 1950 but never completed; the time has now come when we can no longer afford to postpone it.

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POSTBULBAR DUODENAL ULCERATION

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THE diagnosis of postbulbar duodenal ulcer is often missed, and, as a result, patients with a severe and even lethal disability may be regarded as neurotic. Even laparotomy may fail to demonstrate the ulcer, confirming the erroneous clinical impression. Nevertheless, diagnosis is nearly always possible by radiography if appropriate techniques are used, especially if the clinician and radiologist are fully aware of the pitfalls in the diagnosis and work closely together to avoid them.

Before discussing the radiological features, the limits of the duodenal bulb must be defined, so that a clear idea of what constitutes postbulbar territory can be obtained.

The first part of the duodenum extends backwards for a short distance from the termination of the pyloric canal. In this part of the course it usually runs horizontally, though it may have an upward or even slightly downward inclination. Then, at the genu, the duodenum turns vertically downwards in its second part (fig. 1).

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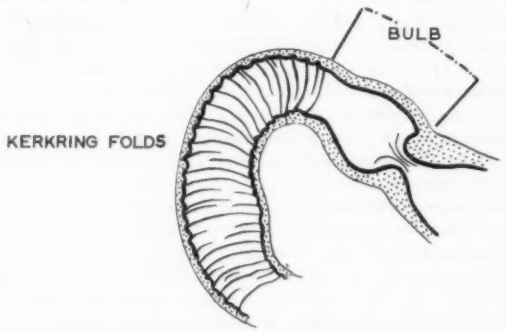

Fig. 1—Diagram showing first and second parts of duodenum, with annular folds beginning at distal end of bulb.

The bulb forms about two-thirds of the first part of the duodenum and is defined by the mucosal pattern. The mucosal folds in the bulb run roughly parallel to its long axis, whereas beyond the bulb the folds become transverse and much coarser in texture. The point of this transition marks the junction of bulb and postbulbar area. We are here particularly concerned with ulcers in the immediate postbulbar area and genu, where they are most difficult to demonstrate radiologically. Any backward inclination of the duodenal bulb tends to align the immediate postbulbar area with the bulb itself or even the pyloric antrum in hypersthenic patients. Ulcers do arise in the second and third parts of the duodenum, but they are rarer, and easier to detect.

Postbulbar ulceration cannot be excluded until the immediate postbulbar area has been fully displayed. In practice, by using a small quantity of barium cream, and taking serial films of the postbulbar region in more or less exaggerated prone and supine positions, one can examine this area effectively without its being obscured by the bulb or pyloric antrum. An overfilled stomach may make examination impossible. A technique which we have found of value in extremely difficult cases, especially in hypersthenic patients, is to give a small quantity of barium cream, manipulate this into the bulb and second part of the duodenum, and then inflate the stomach through the stomach-tube. After suitable rotation of the patient, the postbulbar area can be visualised through the air-inflated pyloric antrum. If satisfactory results cannot be obtained in this way with the patient erect, the same technique can be used in the supine or prone positions (figs. 2 and 3).

Fig. 2.—The ulcer is clearly seen through the air-inflated pyloric antrum (patient supine).

The two cardinal radiological features are the demonstration of the crater itself and of any localised stenosis of the duodenum near the ulcer. In addition, it may be possible to appreciate local alteration of the mucosal-relief pattern around the ulcer. The appearances of the crater are similar to those found in the bulb-

and require no further description. The local stenosis, which is usually present, must be distinguished from incomplete filling of the duodenum or constriction due to normal peristaltic waves.

Fig. 3.—A fairly large postbulbar ulcer seen through the air-inflated pyloric antrum (patient supine).

Differential Diagnosis

A *diverticulum* is the most common source of confusion, but differentiation should be possible because of the smooth rounded outline, the absence of any local stenosis of the duodenum, and the normal mucosal folds running into the diverticulum. A careful mucosal study is necessary to show this. It may be possible to show the neck of the diverticulum. Finally the site is important, the diverticulum being commonest in the second part of the duodenum and rarest in the immediate postbulbar area.

An *adhesion band* may constrict the duodenum to produce an area of stenosis, but absence of an ulcer crater and of mucosal changes should serve to avoid confusion.

Carcinoma of the pancreas may produce a constriction of the duodenum. Other features must be looked for, especially forward displacement of the duodenal loop and widening out of the arc of the duodenum.

Annular pancreas may cause confusion as it constricts the duodenum. Absence of a crater and dilatation above the constriction are the points to look for.

Malignant tumours of the duodenum will show irregularity of contour of the growth and possibly irregular translucent areas due to protrusion of growth with the lumen. Also the stenosed area may be more diffuse than is the case with an ulcer.

Benign tumours may produce rounded translucent areas with no evidence of stenosis.

Case no.	Sex	Age	Length of history (yr.)	No. of hæmorrhages before diagnosis	No. of barium-meal examinations	Night pain	Back pain	Intermittent obstruction	Gastric HCl
1	M	52	20	..	8	+	+	+	Low
2	M	65	5	..	1	+	+	+	N.K.
3	M	47	6	2	1	+	+	−	High
4	M	38	6	1	3	+	+	+	High
5	M	64	3/12	1	2	+	+	−	High
6	M	47	5	2	3	+	+	−	Normal
7	M	24	4	1	2	+	+	+	High
8	M	62	18	..	5	+	+	+	N.K.
9	M	47	21	..	3	+	+	−	High
10	M	47	4	2	3	+	−	−	Low
11	M	22	8	..	3	+	+	−	N.K.
12	M	59	31	4	3	−	+	−	N.K.
13	M	75	20	3	4	+	+	−	High
14	M	44	3	1	3	+	−	−	N.K.
15	M	68	4	1	3	+	+	−	High
16	F	48	13	1	3	+	N.K.	−	N.K.
17	M	69	40	2	1	+	+	−	N.K.
18	M	41	12	1	4	+	+	−	N.K.
19	M	54	10	1	1	+	+	−	N.K.
20	M	33	7	..	3	+	−	−	N.K.
21	F	35	6	..	3	+	+	−	High
22	M	75	35	..	2	+	+	−	Normal
23	M	47	3	..	2	N.K.	+	−	High
24	M	63	10	1	3	+	−	−	N.K.
25	M	29	3	..	1	+	N.K.	−	N.K.

N.K., not known.

At the Central Middlesex Hospital, in the year 1949–55, 25 cases of postbulbar duodenal ulceration were diagnosed.

Features of Postbulbar Ulcers

Incidence

Increasing awareness of the lesion has improved our standards of diagnosis considerably. 10 cases were diagnosed during the five-year period 1949–53, in 9732 barium-meal examinations, but 15 cases during the two years 1954–55, in 4016 examinations.

Portis and Jaffe (1938), in a series of 9000 necropsies with 158 duodenal ulcers, found that 5% of the ulcers were beyond the bulb. Perry and Shaw (1893), in their large series of necropsies, found 12% of duodenal ulcers beyond the bulb. Brulé et al. (1936) collected 94 cases of ulcers in the second part of the duodenum, of which 84% were ampullary. As Preiskel (1952) points out, there is a wide difference between the pathological and the radiological incidence.

Age-incidence.—Most workers agree on the high average age of patients with postbulbar ulcers. Samuel (1952), with whose series ours is most comparable, gives 54 as the average age of his 12 patients, with a range of 22 to 82. He attributes this high average age to delay in diagnosis, and we agree. The average age in our series is 51·2 (range 22 to 74) (see table).

Sex-incidence.—Our 25 patients comprised 23 men and 2 women, a much higher ratio of men to women than is the case with duodenal ulcer in its more usual site.

Length of History

The average length of history in our series was just over twelve years, with a range of three months to forty years. Samuel comments that in 5 of his 12 cases the history was longer than five years, and in 3 longer than twelve years. Again we feel that this high figure is due to delay in diagnosis.

Fig. 4.—Case 6: the ulcer is just beyond the apex of the bulb. There is also stenosis of the lumen of the duodenum in the region of the ulcer (patient prone).

Clinical Features

These patients' symptoms are generally severe and distressing. The most common is pain.

Night pain was present in 20 patients. It was generally in the back or right scapular region, occasionally in the hypochondrium, often felt only at night. It was difficult to relieve, and more often only transiently relieved by alkalis or food, or occasionally by some unusual drink—e.g., case 1 obtained relief by taking "liver salts".

Back pain was the second most common symptom, and was felt anywhere from the right loin to the left scapular region. It was severe and difficult to relieve by food and alkalis. It might at first be periodic in character, with several weeks'

freedom between attacks, but later became more frequent and might be felt daily.

Hæmorrhage. — 15 of our patients at some time had hæmatemesis or melæna, generally the latter, and bleeding was severe and difficult to control. In case 6 (fig. 4) and case 13 (fig. 5), emergency surgery had to be undertaken.

Fig. 5.—Case 13: the ulcer is in the immediate postbulbar area, with much local stenosis of the duodenum (patient supine).

Case 13.—A retired business-man, aged 75, attended the outpatient department in March, 1954, with a twenty-year history of severe attacks of pain and vomiting, especially when he was worried. The pain was mostly in the back and kept him awake for a considerable time at night: at first it was relieved by food and alkalis but later these were of little use. In 1953 he had had a severe attack of melæna, for which he had a blood-transfusion. Three barium-meal examinations were all negative, though a clinical diagnosis of duodenal ulcer had been made.

In March, 1954, a barium-meal examination at the Central Middlesex Hospital showed a large ulcer crater in the second part of the duodenum on the medial side and a deformed duodenal bulb. Much duodenal stenosis was evident. In view of his age, obesity, and hypertension he was felt to be a poor operative risk and he was followed up as an outpatient. He kept reasonably well until October, 1954, when he had a hæmatemesis and was admitted to hospital. He settled down quickly and was anxious to return home without further treatment. He remained well until December, 1954, when he was again admitted, this time with a severe hæmatemesis and melæna, which continued for some days. Despite his poor general health it was felt that operation was essential to save his life. The operation was technically very difficult. A large ulcer was present in the second part of the duodenum which extended into the bulb. The ulcer was nearly 3 in. long, and this made closure of the stump very hard. The stump broke down within a few days and the patient died some three weeks later.

Intermittent duodenal obstruction.—5 patients in this series had a history suggesting intermittent upper intestinal obstruction—severe sudden pain and continuous vomiting lasting up to four days, with gradual recovery. They were generally quite well between the attacks. In all, pyloric stenosis was diagnosed eventually, but 2 were submitted to laparotomy before a correct diagnosis was made. These 5 form a subgroup which we feel could be diagnosed clinically. All of these cases showed narrowing of the duodenum at the site of ulcer radiologically.

Case 4.—A postman, aged 38, attended the Central Middlesex Hospital in 1951 with a slight hæmatemesis and melæna. A barium-meal examination showed a large ulcer crater in the second part of the duodenum. He remained well for some time, but later developed very severe attacks of vomiting and back pain, which lasted several days and from which he completely recovered with no symptoms in between. He had these attacks about six or seven times a year. He moved away from this area and attended several other hospitals where he had three negative barium-meal examinations and where neurosis was diagnosed twice and intestinal obstruction once. At this time a laparotomy was performed but nothing abnormal was found and no further operation was undertaken.

Soon after leaving the hospital he had a further attack and came back to the Central Middlesex Hospital, where a barium meal confirmed the presence of an ulcer and he was admitted for a partial gastrectomy. At operation no ulcer was apparent from the external appearances, though the surgeon noted a slight thickening of the head of the pancreas. Later an ulcer was felt in the posterior wall of the second part of the duodenum. Again difficulty was experienced in closing the stump, and for a few days postoperatively there was a slight leak from the suture line. Soon, however, he made full recovery and when seen later said that he "was a new man".

Duodenal obstruction may become persistent if allowed to continue for long without treatment.

Case 8.—A retired business-man, aged 62, had an eighteen years' history of pain and intermittent attacks of vomiting, becoming more severe, and nearly continuous for the year before operation. At operation a postbulbar duodenal ulcer was found and the second part of the duodenum was very narrowed and fibrosed.

Perforation occurred in 1 case (case 6), coincidentally with a severe hæmatemesis. The perforation was discovered at emergency operation.

Associated Conditions

Diabetes mellitus.—2 patients (cases 5 and 23) also have diabetes mellitus; in case 23 this developed at the same time as his symptoms of postbulbar ulcer. Case 18 has a low renal threshold for glucose and may have diabetes. We are not prepared to draw any conclusions from so small a number of cases.

Peptic ulcer.—Outside this series of 25 patients we have seen 4 others with a coincidental ulcer in the bulb. These have not been included in the series because we felt that the clinical findings might be obscured by an ulcer in the more usual site.

Investigations

Barium meal.—The table shows that the average number of barium-meal examinations carried out in our patients before a diagnosis was made was 3 (range 1 to 8). Taken in conjunction with the rest of the clinical history, this itself is a suggestive feature.

Gastric hydrochloric acid.—Test meals were given to 13 of the patients, but did not prove a real aid to diagnosis. 9 patients had a high acid curve; 4 had a low curve.

Treatment

In postbulbar duodenal ulcers medical treatment is usually unsatisfactory; operation is indicated in most cases, and should be undertaken when the patient is relatively well.

7 patients in this series have had gastrointestinal operations.

1 had a gastroenterostomy because he was a poor operative risk. He has subsequently done very well.

6 patients had a Polya partial gastrectomy. 2 of these were operated on as emergencies for severe hæmorrhage; 1 also had perforated his postbulbar ulcer. Both were severely ill at the time of operation and both died later. The remaining 4 have done very well, though 3 had a stormy postoperative period with leakage from the duodenal stump in 2 cases.

These operations are often technically difficult. The identification of the ulcer may not be easy, and becomes harder the further away from the bulb the ulcer is situated. The actual closure of the duodenal stump also presents difficulties, for at operation the ulcer is often found to have extended into the bulb, making proximal closure impossible. In such cases, Bancroft's operation may be

helpful: the pyloric antrum is divided about 1 in. proximal to the pylorus, and the mucosa is cored out before closing the stump.

Summary

25 cases (23 in men and 2 in women) of postbulbar duodenal ulcer have been studied.

Postbulbar duodenal ulcers comprise all those that arise in the duodenum beyond the bulb, though this article is mainly concerned with those in the immediate post-bulbar area.

Diagnosis depends on awareness of the disease and cooperation between clinician and radiologist.

Two groups can be separated out in which a tentative clinical diagnosis can be made:

Hæmorrhage group. Typically the patient is a middle-aged man with a long history of pain, one or more attacks of bleeding, and usually several negative barium-meal examinations.

Intermittent obstructive group. Typically the patient is a middle-aged man with a long history of attacks of profuse vomiting and severe pain lasting a few days. He is relatively well between attacks, and has usually had several negative barium-meal examinations.

The most important symptom is hæmorrhage, for it is often severe and hard to control by medical means. Elective partial gastrectomy, if possible, is indicated in most cases.

Perforation is rare.

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FLEXION SPASMS AND CONTRACTURES IN SPINAL-CORD DISEASE

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THE late stages of spinal-cord disease—e.g., disseminated sclerosis—are often associated with extreme degrees of flexion and adduction deformity of the legs. Contractures and spasms combine to cause pain, and they may make the sitting position impossible. Distress and deformity are often made worse by loss of sphincter control and bedsores.

We have attempted to deal with scores of such patients in recent years; and, since the methods used have slowly become much more effective, it seems desirable to record briefly some of our conclusions.

Prevention

We are increasingly aware of the possibilities of prevention. Thus a patient with spastic paraparesis who can stand and walk a few steps every day will maintain a predominance of tone in extensor muscles sufficient to prevent any serious tendency to develop flexion spasms. Should, however, such a patient have to go to bed even for a few days—e.g., on admission to hospital—the lack of standing exercise apparently allows the flexors to "take over". If the dangers of this situation are not recognised, the spastic flexor muscles quickly shorten, contractures develop, and the patient may never again be able to stand or walk. Thus, in cases of spinal-cord disease causing severe paraplegia, a day or two in bed may lead to the permanent loss of all capacity to be other than chair-ridden or even bedfast. Hemiplegics, on the other hand, should not be allowed to develop flexion deformities, because all hemiplegics can walk a little, if their general condition allows, and this stimulus maintains extensor tone in the affected leg.

When, however, going to bed is unavoidable in a patient with spinal-cord disease, several measures should be taken to counter flexion spasms. In the first place, if the general condition permits, a few minutes' weight bearing every few hours is of great value. Secondly, all such patients should lie prone for several separate periods each day according to the severity of their disease. This posture provides a very powerful counter to flexion movement both by the physical factors involved in this posture and by a physiological tendency for this posture to inhibit flexion. It is advantageous to arrange the bed so that the feet hang over the end of the mattress. Where adduction spasm is troublesome, pillows may be used to force the knees apart.

The sitting position, in bed or in a chair, should only be allowed for limited periods, because this encourages shortening of these muscles. Further, the sitting position increases the hazard of bedsores owing to the increased weight on the buttocks.

Correction of Contractures

Once contractures have formed, it is necessary to introduce some extra mechanical force to counter the deforming effect of the muscles involved. There are many different ways in which this can be done, but we feel that the following principles may be identified:

(1) Prolonged gentle pressure by springs, traction, or turnbuckle plaster is not usually suitable, because the skin will not tolerate the forces required.

(2) The skin will, however, tolerate great pressure for limited periods. If skilfully applied, such pressure constitutes a very powerful means of countering and correcting flexion contractures. Thus, a pressure of 100 lb. applied by sling to knee or ankle is well tolerated for 30 minutes, three or four times daily, and this can with advantage be followed by a period of lying prone.

(3) One very effective method of pulling out the contracture at the knee, which often develops, is to place the patient prone and to hang a weight on the heel, which is projecting beyond the end of the mattress. This effect is increased if vertical upward pull is exerted on the knee through a sling-and-pulley system connected to a weight.

(4) Heavy weights might, however, in certain circumstances tear through some of the contracted tissues; so the method described by Russell and Schuster (1951) is safer because the amount of pull is measured and, if the tissues give way, the strength of the traction immediately decreases.

Thanks to the devoted work of both physiotherapists and nurses, these and other similar methods have had some striking successes, but for the worst cases several months' treatment has been necessary to pull out the contractures. The following case illustrates this.

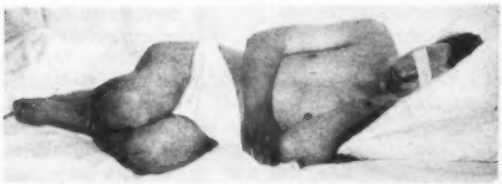

Fig. 1—Case 1: condition on admission (April, 1956) showing degree of flexion contracture.

Case 1.—A soldier, aged 22, contracted tuberculous meningitis while serving in the Army abroad. He was evacuated by air on Jan. 25, 1955, to the Military Hospital, Wheatley, and admitted under the care of Dr. Honor Smith. He deteriorated considerably during the flight and was semi-comatose on arrival. A prolonged and stormy illness followed. Its course was complicated by spinal block of long duration, persistent vomiting, an episode of cerebral hæmorrhage causing dysphasia after intraventricular therapy, decorticate attacks probably of vascular origin, and renal infection with profound disturbance of electrolyte balance. During the acute stage of the disease he had more than 350 lumbar, cisternal, and ventricular taps. However, the infection was eventually eradicated, and he was admitted to Stoke Mandeville Hospital for rehabilitation on April 6, 1956, fifteen months after the onset of his illness.

On admission his general condition was fair, but he was thin and content to lie in bed. He had little dysphasia and was partly oriented in time and space but was amnesic for the whole of his time in hospital and abroad (about two years). He read J1 with each eye. Both fundi showed mild optic atrophy. He had slight bilateral deafness. The movements of his arms were excellent. In relation to the spinal block which developed during his illness there was now spastic paraplegia and his legs showed severe flexion contracture (fig. 1). Strong manual force was needed to overcome the spastic element, but there still remained about 60° of fixed contracture at both hip and knee. There was no sensory loss in the legs.

Treatment.—The deformity was lessened a little each day by various forms of therapy, including repeated stretching on the appliance designed by Russell and Schuster (1951), colloquially known as the "rack" by the ward staff. The name is inaccurate because its action is not one of traction, but is exactly comparable to that of applying a downward pressure on the knees of an oarsman on a sliding seat. It differs in that the patient lies on his side and the force is applied hydraulically and is virtually isometric.

Fig. 2—Case 1 in July, 1956.

Fig. 3—Case 1 in December, 1957.

Progress was slow, but the contractures yielded slowly. By July, 1956, the patient could move a little in walking-plasters, and in December, 1957, he was walking well without plasters. Spastic paraparesis persisted but with minimal contracture (figs. 2 and 3).

Surgical Operations

Attempts to correct flexion contractures by operation have encountered difficulties. Thus division of tendons is often disappointing, and rigid splinting to maintain improved posture after operation may cause necrosis of skin unless the procedure provides sustained reduction of the flexor spasms.

It must also be appreciated that discomfort from the surgical incision stimulates flexion spasms vigorously, and the results in the past have often been disappointing.

Division of the obturator nerves, however, gives striking relief to the patient who develops severe adduction spasms.

Division of lumbar and sacral motor roots relieves all spasm in the legs, without loss of sensation, but the gluteal muscles waste so severely that sitting becomes uncomfortable. Large intrathecal injections of alcohol to destroy cauda equina are used in cases of complete transection of the cord (Guttman 1949) but are not suitable for the partial lesions considered here.

A striking success has been achieved recently by a combination of operations including neurectomy, tenotomy, and tendon transplant. The groups of muscles most amenable to surgical treatment are the adductors and flexors of the hip, the hamstrings, and the calf muscles, and the operations used include the following:

(1) *Adduction and flexion of the hip.*—Obturator neurectomy (Stoffel 1912) alone will relieve adductor spasms, and in bilateral cases without contracture the abdominal approach is used. In our cases, however, there is usually contracture of both the adductors and the hip flexors, and for this to be relieved it is necessary to divide the tendon of the iliopsoas muscle to relieve shortening or spasm of this muscle. An incision is made over the tendon of the adductor longus muscle; the origins of the adductor longus and brevis muscles are separated from their bony attachments; the anterior and posterior divisions of the obturator nerve are then divided. By following the upper border of the adductor magnus muscle one is led to the insertion of the iliopsoas muscle, which can then be divided In closing the wound the origins of the adductors are not sutured back into place. After operation gentle assisted abduction and extension, combined with lying prone are practised on the day following operation. Standing out of bed is begun on the third day.

(2) *Flexion of the knee.*—The insertions of the biceps, semitendinosus, semimembranosus, and gracilis muscles are transplanted to the femoral condyles by the technique of Eggers (1952). This may be combined with section of the branches of the posterior tibial nerve to the gastrocnemius muscle. After this operation a plaster is well tolerated and is applied from the groin to the toes. This is removed after two weeks, and active extension of the knee is begun together with lying prone.

(3) *Spastic equinus.*—This condition can often be relieved by simple tenotomy of the tendo Achillis. This operation causes a shuffling gait with loss of spring in the foot, but this is of little importance in chair-ridden patients. This operation may not only relieve painful spasms but also may enable the patient again to walk a little with assistance.

Illustrative Cases

The following case-reports illustrate the outstanding advantages of selecting a combination of these operations for

cases which do not respond to simple non-surgical methods.

Case 2.—A man, in whom multiple sclerosis presented with difficulty in walking in 1937 at the age of 24, walked sufficiently well to be accepted into the Army in 1939 but was invalided in 1941 because his legs became weaker. From that time onwards he became steadily worse and he last walked in 1952 with assistance. In this year there was an episode of weakness in the left arm, which did not recover completely and so added to his disability. He remained at work as a clerk, using an electric chair outside and a wheel chair indoors. By 1957 flexor spasms of the legs had become so severe that it was difficult for him to sit in a chair. The movement and pain caused by these disturbed his sleep and greatly impaired his efficiency at work.

On admission to Stoke Mandeville Hospital on Aug. 6, 1957, for assessment he obviously had severe discomfort and pain during the spasms. He was demoralised by lack of sleep and appeared tired, pale, and older than his years. The positive signs present were nystagmus on lateral and vertical gaze, severe spastic weakness of the left arm with sensory loss of posterior column type, spastic chest and abdominal muscles, and spastic paraplegia with a tendency to flexion contractures. Flexor withdrawal of both legs was induced by even light touch on the foot. There was little adduction spasm. By firm manual restraint the knees and hips could be extended to a minimum of 15° of fixed flexion.

Operation on the left leg was done by one of us (G. P.) on Aug. 16, 1957, under general anæsthesia with relaxants. The tendons of the biceps and semimembranosus muscles were implanted into the posterior aspect of the femoral condyles, and the nerves to the calf muscles were divided. The tendon of the semitendinosus muscle retracted so vigorously into the wound that it could not be implanted. A plaster-of-paris cylinder was applied to the limb from the groin to the toes.

Postoperatively, incisional pain caused a temporary increase in spasms, but these were reduced by administering pethidine, and they became much less distressing after four or five days. The plaster was removed a fortnight after the operation. The incision and the skin were in excellent condition. There was a striking relief of pain by three weeks after the operation. The pattern of the spasm had altered completely, and the frequency was much less. There was no flexion of the knee during a spasm. The quadriceps was observed to contract, but this was not painful. The spasm at the hip was less and no longer uncomfortable. There was little change in the right leg, but the patient could sleep prone for much of the night, which had been impossible before the operation. On discharge on Sept. 16, 1957, he was just beginning to stand again with assistance. He was deliberately discharged to avoid too long an interruption in his employment.

Follow-up.—When he was seen on Oct. 2, 1957, he was distressed by spasm in the other (right) leg and pleaded to have a similar operation on this side also. This was done on Nov. 8, 1957, the procedure being identical except that it was possible on this occasion to implant the tendon of the semitendinosus muscle in addition to the others.

Postoperatively, pain made the spasms worse for a time, but the end-result was the same as that achieved on the left side. The patient's general condition improved, and he began to sleep well again. Both legs are still subject to slight flexion spasms at the hips, but the movement is small in amplitude. He can sit comfortably in a chair and can lie prone quite easily. He stood again with support four weeks after the second operation. In March, 1958, the improvement was well maintained and he was again at work.

Case 3.—Multiple sclerosis presented in a woman aged 29 in 1939 with paræsthesiæ in the right arm and leg, stiffness, aching, and weakness of the right leg, and weakness of the right hand. From 1939 until 1954 or so she had a remarkable series of fluctuations and relapses, often with considerable remission in the intervals. From 1954 her disability increased steadily because of increasing paraparesis with frequent flexion spasms causing severe pain in her legs and lower back. In 1954 she would walk several miles and do all her shopping. In the three months before admission her walking became much worse.

On admission to Stoke Mandeville Hospital on Aug. 25, 1957, at the age of 47, she could walk a few steps with assistance. She complained of stiffness and pain in all the muscles from her waist downwards. She had difficulty in winding a watch, and her writing had deteriorated considerably.

On examination she was mildly euphoric and loquacious. The right fundus was pathologically pale. She read J1 with each eye. She had a slightly enlarged left pupil and slight left ptosis, but her external ocular movements were full. Slight left facial weakness, minimal ataxia on the finger-nose test, and slight impairment of fine finger movement were noted. The deep reflexes in her arms were increased except for diminution of the right supinator jerk. Sensation was impaired and was mainly moderate loss of posterior column function. Her abdominal reflexes were absent, and her lumbar and abdominal muscles were slightly spastic. A partial sensory level was found at T8, with mild loss of perception of all modalities below this. Her legs showed severe spastic paraparesis with painful and distressing spasms of forced extension and adduction. When these came on she had considerable low back pain. Her deep reflexes were increased, and she had ankle clonus and extensor plantar responses. Her general condition was fair except for mild anæmia (Hb 76% = 11·2 g. per 100 ml.), but she looked tired and unwell.

Progress.—She unfortunately acquired influenza during treatment soon after admission, and this kept her in bed for a few days, during which she lost ground rapidly and flexion and adductor spasms became dominant over her weak powers of extension. Progress with physiotherapy was so slow and she had such considerable distress and pain with the spasms that it was decided to operate.

Operation.—On Nov. 8, 1957, under general anæsthesia the deformities of the hips and knees spontaneously corrected and there was little or no evidence of contracture. An incision was made over the tendon of the adductor longus muscle on each side. The tendon was divided from its origin and turned down to expose the anterior branch of the obturator nerve. One inch of the nerve was resected and the origin of the adductor brevis muscle was then divided and the muscle turned down to expose the posterior division of the nerve, which also was divided. By following the upper margin of the adductor magnus muscle the insertion of the iliopsoas muscle was identified; it was found to be contracted and was divided. The patient was then turned on her face. An S-shaped incision was made over the popliteal fossa and upper calf on each side. This type of incision is used to avoid subsequent contracture of the scar. The insertions of the semitendinosus, semi-membranosus, gracilis, and biceps femoris muscles were identified and divided. The first three tendons mentioned were transplanted into the posterior aspect of the medial femoral condyle, and the last-named tendon into the lateral femoral condyle. The motor branches arising from the posterior tibial nerve and supplying the soleus muscle were identified and divided. The wounds

Fig. 4—Case 3: preoperative posture during active spasms of right leg; note considerable adduction of both legs.

Fig. 5—Case 3: postoperative absence of adduction; note extension of both legs (flexor spasm could not be induced).

were then closed, but no attempt was made to re-attach the adductor origins. The knees were immobilised in the straight position by padded plaster cylinders.

Postoperatively the patient's blood-pressure fell somewhat, and she required methylamphetamine, dextran, and blood to restore her circulation to normal. This was probably the result of doing the operations on both sides at one session. The patient had been turned twice during the operation. There was incisional pain of some severity which caused increased spasm for about ten days, and she required pethidine frequently to control this. However, after the plasters were removed, the incisions were found to be in excellent condition, and she began to improve. As in case 2 perhaps the most striking improvement was in her general appearance. This improvement was parallel with the lessening of her pain. Flexion spasm was replaced by extension spasm which was not distressing. She began to stand with plasters about three weeks after the operation and can now, five months after operation manage a few steps with assistance (figs. 4–6).

Fig. 6—Case 3 standing supported after operation.

Discussion

In case 1 the spinal-cord disease was completely arrested, and it proved possible to pull out severe contractures over a period of many months. In retrospect, however, it seems that this good result would probably have been obtained more quickly with the assistance of surgery.

In cases 2 and 3 there is progressive disease of the nervous system with no prospect of a good recovery of crural functions, and for these we used a combined operation to deal with all the main muscle groups affected. This operation not only divided or paralysed the muscles causing deformity but also converted the hamstring muscles from knee flexors to thigh extensors. The early postoperative results are most gratifying and much better than any we have achieved by other means. Relief of both pain and spasm is most noticeable, and there is every indication that this type of operation can keep these unfortunate patients much more comfortable and active than would otherwise be possible.

Summary

In non-progressive cases of flexion spasms good results may be obtained by mechanical devices which apply powerful correcting forces two or three times daily for periods of about 30 minutes each.

In severe cases operation may give excellent results by one or all of the following procedures: obturator neurectomy; division of the tendon of the iliopsoas muscle; transplantation of the hamstring tendons to the back of the femur; division of the nerves to the gastrocnemius muscle; and section of the tendo Achillis.

These combined operations can be used to give great relief to patients with flexion contractures and spasms due to spinal-cord disease.

We wish to pay a special tribute to the nurses and physiotherapists, whose tireless interest in helping the patients make these results possible.

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INFLUENCE OF FASTING ON THE IMMUNOLOGICAL REACTIONS AND COURSE OF ACUTE GLOMERULONEPHRITIS

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Volhard (1937) claimed that fasting is one of the most effective means of treating acute glomerulonephritis, and this has often been confirmed. After fasting, all the acute manifestations (reduction of glomerular filtration-rate (G.F.R.), hypertension, and œdema) rapidly subside (Brod 1949); but we do not know why. Volhard himself thought that an overtaxed circulation was unburdened, but this view is hard to sustain. Because the rational basis of this treatment was uncertain, many physicians abandoned or changed it; and some have even suggested that acute fasting might hasten the development of uræmia, as happened in rats that were starved after partial nephrectomy (Persike 1950) or in experimental Masugi nephritis (Dutz et al. 1956).

But in acute glomerulonephritis it is less important to prevent uræmia than to shorten the disease. The ultimate prognosis of the disease depends on both the intensity and the duration of the acute stage (Brod 1949, Brod et al. 1955) which, according to present opinion, is caused by an autoallergic vascular reaction. We cannot influence the intensity, but every means of shortening the acute stage must be used.

Since fasting seemed to have so great an effect, we thought it worth while to investigate whether fasting interfered with the capacity to produce an autoallergic reaction. Many victims of the concentration camps, who had previously had allergies, lost them during their period on a semi-starvation diet (Šmahel 1946).

The autoallergic reaction in acute glomerulonephritis is accompanied by a raised serum titre of certain agglutinins (collodion agglutinins), which may represent anti-kidney antibodies (Cavelti and Cavelti 1945a and b, Lange et al. 1949, Lippmann et al. 1950, Wagner and Holečková 1951, Rejholec et al. 1952). We have, therefore, followed the change of the titre of these agglutinins in the course of therapeutic fasting in acute glomerulonephritis, and compared the course of these changes with

the course of the main clinical and functional manifestations of glomerulonephritis.

Methods

The patients investigated were treated in our institute, or in the pædiatric department, with enforced strict bed rest. Fasting was usually started 24 hours after admission. During the first 24 hours in hospital, the patient was kept on a light diet, and basal data of his renal functions and (in most cases) collodion agglutinins were obtained. The period of fasting lasted 60 hours; the patients received neither food nor fluid, except for some 100 ml. a day of unsweetened fruit-juice. They were given no glucose (Pevzněr (1949) holds that glucose increases the likelihood of allergic reactions).

When the 60-hour period was over, the patients were put on a semi-starvation diet, consisting mainly of fruit and vegetables, and yielding no more than 500 calories, which was continued until all signs of the acute vascular reaction (reduced G.F.R., hypertension, and œdema) had subsided. Only then did we go over to a normal diet or to the quantitative diet of Addis (1948).

As a control we used a group of children from the pædiatric department. They were also kept strictly in bed, but were given a light diet with no fasting period. Such a diet is used in the treatment of glomerulonephritis by most pædiatricians (Rabinovich and Winter 1950, Mores and Navrátil 1952).

From the first day the G.F.R. was estimated by the clearance of endogenous creatinine in 4-hour periods throughout the whole period of observation. Daily Addis counts of the urinary deposit were made. Blood-pressure and fluid-balance were measured daily.

The titre of the collodion agglutinins was estimated (Cannon and Marshall 1940, Cavelti 1941, 1948, Humphrey 1948, Lange et al. 1949, Wagner et al. 1952, Wagner 1954).

Collodion stock suspension was prepared by the method of Wagner and Rejholec (1952) and Wagner (1954); it lasts 3 weeks. This stock solution was diluted with 1·1% saline or Ringer's solution to McFarland's grade-2 density. The antigen was prepared from a healthy human kidney, as free from blood as possible, ground up and diluted 1 : 4 with either saline or Ringer's solution. This suspension was kept at −30°C. On the day of investigation 1 part of this solution was added to 20 parts of the collodion suspension. The antigen-collodion suspension was incubated for 1–2 hours at room temperature. The serum to be investigated was diluted geometrically with the saline or Ringer solution. To the diluted serum, an equal amount of the incubated collodion-antigen suspension was added (usually 0·25 ml. are used). After 2 hours' incubation at room temperature, the test-tubes were centrifuged for 3 minutes at 1200 revolutions per minute. The deposit was stirred and examined in reflected light without magnification. If the particles were just visible, the result was ±; if the particles formed lumps of 1·5 mm. in diameter, the result was ++++. The highest geometrical dilution of serum containing antibodies was usually ±, and this dilution grade is indicated in tables I and II. But when there was agglutination at dilutions 1/16 and higher, the lowest dilution usually gave a ++++ result, with at least + in the 1/8 dilution. The "dubious" 1/4 titre was the only one where only a ± result was sometimes obtained.

Control specimens of the diluted collodion and the collodion-antigen suspension were always examined for spontaneous agglutination. Normal sera always gave negative results. A titre of 1 : 4, though never found in normal subjects, was regarded as a dubious result; a titre of 1 : 8 was regarded as positive (Lange et al. 1949, Rejholec et al. 1952). The highest titre observed by us in human glomerulonephritis was 1 : 128.

Results

Patients Treated by Absolute Fasting

Of twenty-nine patients with acute glomerulonephritis, four were adults (aged 22–59) and twenty-five children (aged 5–15 years). In twenty patients, a positive titre of collodion agglutinins was found in the serum on the day of admission. In two others, in whom the titre was first estimated on the 1st day of treatment, a positive titre was also found. Another four had dubiously positive titres of 1 : 4. The initial titres were negative in only three.

Of the twenty-six positive and dubious titres at the beginning of treatment, nineteen became negative immediately after the end of the fasting-period (table I). In

TABLE I—PATIENTS TREATED BY ABSOLUTE FASTING

Case No.	Age (yr.)	Sex	Days from onset of glomerulonephritis to fasting	Titre of collodion agglutinins		Days from fasting to disappearance of agglutinins	Days from start of disease to disappearance of agglutinins	Glomerular filtration-rate (ml. per min.)		Days from fasting till G.F.R. became normal	Blood-pressure (mm. Hg)		Days from fasting till B.P. became normal	Œdema		Days from fasting till œdema disappeared	Remarks
				Before fasting	After fasting			Before fasting	After fasting		Before fasting	After fasting		Before fasting	After fasting		
1	7	F	3–4	1 : 8	0	4	7–8	10·7	35·1	4	125/70	110/75	..	+	0	5	..
2	10	F	7	1 : 8	0	1	8	43·7	46·6	14	180/130	115/80	2–4	+	0	2	..
3	11	F	5	1 : 16	0	3	8	35·0	63·6	4	150/110	115/70	2–3	+	0	4	..
4	11	M	5	1 : 64	1 : 16–0	6	11	45·8	75·6	2	160/130	135/60	7–8	++	0	6	..
5	15	M	6	1 : 16	0	4	10	50·5	58·4	6	130/90	120/90	2	0	0	..	..
6	8	F	8	1 : 8	0	5	13	14·9	42·7	3	140/100	115/85	2	++	0	3	..
7	13	M	7–10	1 : 4	0	0–3	7–10	57·2	63·5	5	120/90	105/70	..	0	±	..	..
8	8	F	2	1 : 32*	1 : 8–0	3	5	..	30·2	6	120/95	115/85	..	++	0	1	..
9	11	F	4	1 : 4	0	0	4	42·9	56·8	6	150/100	120/70	2	+	0	2	..
10	9	F	7	1 : 32	1 : 8	10	17	..	32·1	9	150/100	115/70	3	0	0	..	When fasting was stopped, the titre rose again
11	13	F	10	0	0	Neg.	Neg.	14·7	11·4	..	155/100	125/80	3	++	0	2	..
12	48	F	1	1 : 128*	1 : 8	6	6	35·4	55·1	6	185/135	155/100	..	+++	+	6	History of hypertension before the onset of glomerulonephritis
13	8	M	13	1 : 4	0	1	14	18·8	28·0	5	115/60	95/60	..	+	0	1	..
14	59	F	9	0	1 : 128	3	..	67·8	73·8	6	240/120	215/115	..	++	+	5	History of hypertension before the onset of glomerulonephritis
15	6	F	3–4	0	0	Neg.	Neg.	33·8	34·3	10	100/60	85/60	..	0	0	..	..
16	41	M	5	1 : 8	0	3	8	99·3	110·0	5	170/100	165/95	..	+	0	4	..
17	11	F	5	1 : 16	0	3	8	39·3	64·3	4	130/90	120/80	2	+	0	3	..
18	7	M	8	1 : 4	0	1	9	30·5	27·2	12	120/75	120/75	..	+	0	2	..
19	13	F	6	1 : 16	0	2	8	53·0	52·4	..	135/95	120/70	..	+	0	..	..
20	7	F	15	1 : 128	1 : 128–1 : 4	7	22	25·7	42·9	7	170/120	135/80	7–8	++	±	7	When fasting was stopped, the titre rose again
21	8	M	5	1 : 64	1 : 4–0	6	11	56·3	47·9	..	150/120	120/90	3	+	±	10	..
22	8	M	6	1 : 8	0	3	9	14·8	31·8	6	130/95	105/65	3	0	0	2	..
23	9	F	4	1 : 8	0	1	5	37·4	45·3	8	130/70	115/70	..	0	0	..	..
24	12	F	3	1 : 8	0	1	4	45·9	64·0	4	140/85	115/75	2	±	0	..	..
25	22	F	4	1 : 16	0	4	8	97·3	80·0	..	130/95	115/90	..	±	0	..	..
26	8	F	45	1 : 8	0	2	47	9·3	13·4	6	160/115	160/105	5	++	+	10	..
27	6	M	61	1 : 16	0	2	63	11·3	35·9	4	135/95	125/90	..	−	−	..	..
28	13	F	152	1 : 32	0	3	155	7·3	17·9	6	125/80	130/95	..	++	+	5	..
29	8	M	31	1 : 16	±1 : 4	13	44	..	30·7	10	120/75	125/70	..	−	−	..	..

* First estimation on the first day of treatment. Neg., negative.

seven others the titres definitely decreased. The average duration from the start of treatment to the time when the titres became zero was 5 days (range 1–13 days).

Of the twenty-six patients with decreasing titres of antibodies, reliable data on glomerular filtration were obtained in twenty-three. By the first day after the end of the fast, the G.F.R. definitely rose in sixteen patients, and in two more an upward trend was probable. At the same time the blood-pressure fell to normal and the œdema subsided in all patients but one.

A boy, aged 15, had had glomerulonephritis for 10 days when he was admitted. Fasting was started 24 hours after admission (fig. 1). The titre of the collodion agglutinins started to drop almost at once. The G.F.R. averaged 50 ml. per min. on the day of admission; after a transient fall on the first day of fasting, when the titre of antibodies was still 1 : 16, it began to increase on the second day and reached 91 ml. per min. 2 weeks later. The blood-pressure, which was 130/90 at the start, fell to 110/70. He had no œdema. There was no consistent change in proteinuria or in the Addis count.

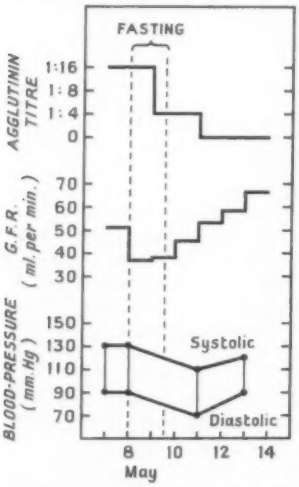

Fig. 1—Course of illness in a boy who fasted.

In three patients the antibody titre started to rise again when the fasting gave place to a light diet containing plenty of carbohydrate (fig. 2).

In three patients whose antibody titres were negative at the start, the fasting had no effect on their G.F.R.

Patients Treated with Bed Rest and Light Diet

This group consisted of nine children aged 5–14. On admission, the agglutinin titre was positive in five, doubtful in one, and negative in four (table II). But in all nine patients the titres became strongly positive in the subsequent days when the children, although resting, were fed a diet rich in carbohydrate.

A girl, aged 9 years, had had acute glomerulonephritis for 4 days (fig. 3). On admission her G.F.R. was 42·5 ml. per min., and the agglutinin test was negative. But on the 3rd day of hospital treatment, consisting of bed rest and light diet, the titre became positive (1 : 8), and 3 days later it reached a maximum of 1 : 32. The agglutinins did not disappear till the 10th day, and it was from this day on that the G.F.R. started to increase, though a few days later it fell to about 38 ml. per min. The fall in blood-pressure and disappearance of œdema were slow, lasting up to the 8th and 10th day respectively of the hospital treatment.

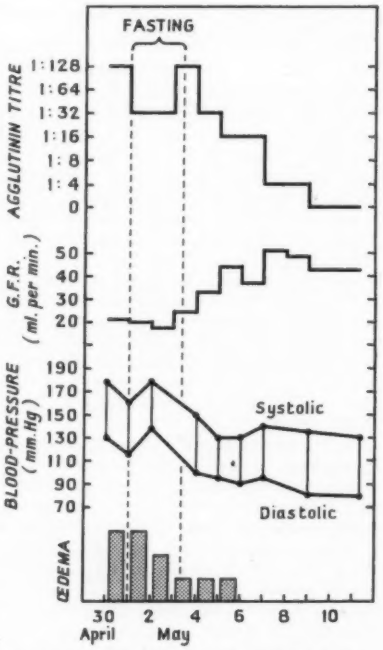

Fig. 2—Rising titres when fasting was abandoned.

A similarly slow disappearance of the signs of acute glomerulonephritis was found in eight of the nine patients. In the 9th patient, a girl aged 13, no improvement was noted over 7 days. Fasting was then ordered, and she improved quickly; but the disease became chronic.

In three patients the glomerular filtration-rate was lowest at the start, in five there was a further drop during treatment, in one the course was interrupted by fasting, and in one (no. 9) the changes could not be followed every day because of technical difficulties. Of the eight patients in whom the G.F.R. was followed long enough, there was an improvement in four 3–28 days after admission, but in none was the rate quite normal then. Four patients had œdema, and it took 2–12 days to disappear. The blood-pressure was raised at the start in five patients. In three it subsided after 3–14 days, in one it remained permanently elevated, and in one hypertension disappeared when treatment was changed over to fasting.

TABLE II—PATIENTS TREATED WITH BED REST AND LIGHT DIET

Case no.	Age (yr.)	Sex	Days from onset of disease to treatment (light diet and bed rest)	Titre of collodion agglutinins				Glomerular filtration-rate (ml. per min.)			Blood-pressure (mm. Hg)		Œdema	
				Before treatment	Maximal titre	Days from admission to disappearance of agglutinins	Days from start of the disease to disappearance of agglutinins	Before treatment	Lowest G.F.R.	Days from treatment to increase of G.F.R. (new rate)	Before treatment	Days from treatment till B.P. became normal	Before treatment	Days from treatment till œdema disappeared
1	10	F	43	1 : 8	1 : 16	7	50	25·95	25·95	3 (35·9)	130/90	3	0	—
2	14	F	2	1 : 128	1 : 128	11	13	77·4	33·1	Not improved	175/125	Not improved	++	12
3	12	F	2	1 : 4	1 : 8	6	8	46·3	46·3	6 (73)	125/80	Normal	0	—
4	9	F	4	Negative	1 : 32	7	11	42·5	36·0	Not improved	140/100	14	+	8
5	10	M	21	1 : 8	1 : 16	26	47	55·4	42·4	28 (72)	125/85	Normal	±	7
6	5	F	1	Negative	1 : 32	9	10	23·8	19·8	10 (33)	90/50	Normal	0	—
7	10	M	8	1 : 16	1 : 32	10	18	28·5	28·5	Not improved	130/90	8	+	2
8	8	M	10	1 : 8	1 : 64	4	14	45·4	38·05	Not improved	110/65	Normal	0	—
9	13	F	7	Negative	1 : 16	—	—	55·8		Fasting	180/120	(Fasting begun)	0	—

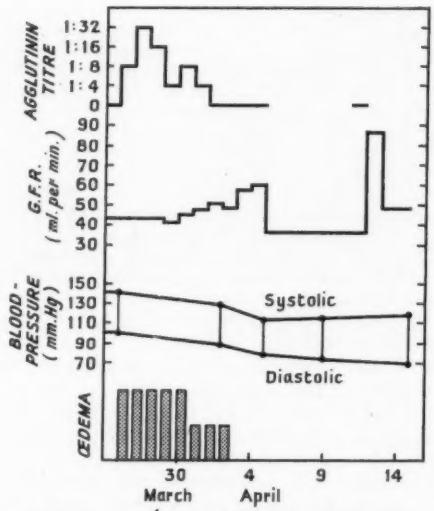

Fig. 3—Course of illness in a girl who did not fast.

Discussion

The exact significance of the collodion agglutinins is uncertain, but there seems little doubt that they indicate the presence, and possibly the intensity, of autoallergic processes which form the basis of acute glomerulonephritis. Fasting can clearly make these agglutinins disappear. At the same time the main clinical manifestations of acute glomerulonephritis—reduced G.F.R., hypertension, and œdema definitely improved.

On the other hand, in nine patients treated only by bed rest and light carbohydrate diet, the titre of agglutinins either remained unaffected or increased, and the clinical course changed more gradually. The G.F.R. rarely increased much or became normal within the period of observation. Œdema and hypertension continued for longer.

The differences between the two groups of patients were compared by the H-test (Wald and Wolfowitz 1944, Kruskal and Wallis 1952, Kruskal 1952), a means of variance analysis. In the patients who fasted, collodion agglutinins disappeared significantly faster, and the G.F.R. and blood-pressure returned to normal significantly sooner than in the control patients (table III). Œdema lasted, on the average, 4·2 days in the patients who fasted, and 7·3 days in those who did not; these differences are not significant.

TABLE III—SIGNIFICANCE OF DIFFERENCES BETWEEN THE TWO GROUPS

—		Days after admission (average)		
		Disappearance of collodion agglutinins	Duration of	
			Reduced G.F.R.	Hypertension
Fasting		5	6·3	3·6
Bed rest + light diet		10	11·7	8·3
Significance	H	8·271	7·081	5·348
	P	<0·01	<0·01	<0·05

Our observations suggest that therapeutic fasting may interfere with the autoallergic processes and thus shorten the duration of acute glomerulonephritis. Further support for this view may lie in the fact that fasting had no effect whatsoever on the clinical course of three patients who had a negative titre of collodion agglutinins on admission. (A similar negative result was found in two other patients—in the "latent" phase of chronic glomerulonephritis, with negative titres of antibodies—who were not included in the present series.)

Brod (1949) has shown that, while direct manifestations of the generalised acute vascular reaction tend to subside, they leave residual damage in the glomeruli and tubular cells; this improves much more slowly or may become permanent. Our data suggest that fasting has an effect only on the course of the early manifestations (reduced G.F.R., œdema, and hypertension), and does not reduce damage to the renal parenchyma caused in the individual patient by the initial vascular reaction. But it seems established that one of the main factors in the ultimate prognosis is the duration of the initial acute vascular reaction in the kidneys. We believe that our data show that fasting can shorten this acute stage, and that all patients with acute glomerulonephritis should fast.

Summary

We describe a technique for estimating a titre of agglutinins which, we believe, indicate an autoallergic process underlying acute glomerulonephritis.

Two groups of patients with acute glomerulonephritis were compared. One group was treated by bed rest and light diet; the other was given no food for 60 hours. In the fasting group, the agglutinin titre, blood-pressure, and glomerular filtration-rate all returned to normal significantly sooner than in the controls. In three patients with normal initial agglutinin titres, fasting did not shorten the illness.

We believe that fasting reduces the severity of the antigen-antibody reaction responsible for acute glomerulonephritis, and should be an essential part of treatment.

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"Reflecting today on the case of a poor woman who had continual pain in her stomach, I could not but remark the inexcusable negligence of most physicians in cases of this nature. They prescribe drug upon drug, without knowing a jot of the matter concerning the root of the disorder. And without knowing this they cannot cure . . . the patient. Whence came this woman's pain (which she would never have told had she never been questioned about it)? From fretting for the death of her son. And what availed medicines while that fretting continued? Why, then, do not all physicians consider how far bodily disorders are caused or influenced by the mind?"
—*The Journal of the Rev. John Wesley* for May 12, 1759. London, 1909–16.

CHANGES IN THE GALLBLADDER AFTER ELECTIVE GASTRIC SURGERY *

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After partial gastrectomy, ingestion of a mixture of hot milk and an egg—the fatty meal of the cholecystogram test—can produce a severe attack of "dumping" (Cox and Kerr 1957). The possible effects of gastrectomy on other digestive functions require study, and we have accordingly investigated the behaviour of the gallbladder, especially after a fatty meal, before and after elective gastric surgery.

Investigation

Using intravenous cholecystography, two series of films were taken (in some cases three) in 18 unselected patients undergoing gastric operations. The first series of films (the immediate preoperative) was taken within twelve days before operation, the second (the immediate post-operative) within twelve days after operation, and the third (the late postoperative) after an interval of not less than six months. A series of films consisted of a two-hour fasting film showing the size and position of the gall-bladder, followed by six films showing the rate of empty-ing after a glass of hot milk with an egg. The reason for carrying out two series in some patients, instead of three, was the potential danger of excessive radiation, most patients having had a recent previous barium meal.

Radiographic Technique

Light diet for three days, avoiding metallic medicines and gassy foods. Early morning cup of milkless tea, then fasting for two hours before intravenous injection of 'Biligrafin' (sodium salt of N:N¹-adipic-di-(3-amino-2 : 4 : 6-triiodo benzoic acid)), 20 ml. of 30% solution. No food or drink for two more hours, then first film taken with patient prone. Patient then given hot milk and whisked egg, and films taken at intervals of five, ten, fifteen, thirty, forty-five, and sixty minutes in identical position. Radiographic factors 65–70 kV, 1 second at 200 mA., with cone.

Results

Gallbladder Volume as Shown by Two-hour Film

Partial gastrectomy (Billroth II, antecolic anastomosis with spur).—9 cases. In 7 there was an immediate preoperative and an immediate postoperative film. In 6 of these, the immediate postoperative film showed dilatation of the gallbladder. In the remaining case, there was no dilatation in the immediate post-operative film. In 6 cases there was an immediate postoperative and late postoperative film. The average time between the immediate and late postoperative films was fourteen months. In 3 of these there was no increase in the size of the gallbladder, but in the remaining 3 the late postoperative film, compared with the first, showed dilatation of the gallbladder, indicating that the volume had increased since the operation.

Partial gastrectomy (Schoemaker).—2 cases. There was an immediate and a late postoperative film in each case. The late film was taken ten months after the immediate. In 1 case, the late film showed that the gallbladder had more than doubled its volume since the immediate was taken. In the other, the late postoperative film showed no change.

* Based on a paper read before the Manchester Regional Association of Surgeons, June, 1957.

Partial gastrectomy and vagotomy.—The anastomosis was antecolic with spur. 4 cases, with a preoperative and a late postoperative film in each. The average interval after operation before the postoperative film was thirteen months. This late postoperative film in each case, compared with the preoperative film, showed that the gallbladder had doubled its volume.

Vagotomy and posterior gastroenterostomy.—3 cases, each with a preoperative and two postoperative films. The average interval between the two postoperative films was eleven months. Between the preoperative and the immediate post-operative films there was no increase in volume of the gall-bladder in 2 cases and a small increase in 1 case. The late postoperative film, compared with the preoperative film, showed definite dilatation of the gallbladder in each case—but less striking than the dilatation after partial gastrectomy. The Hollander insulin gastric-secretion test indicated in-complete vagal section in each case.

Of 15 cases in which a preoperative series of films was followed by at least one postoperative series, the gall-bladder became much dilated in 14. In 1 case there was no dilatation in the final radiograph nine months after a routine antecolic partial gastrectomy with spur. It can be said, therefore, that dilatation of the gallbladder is an almost consistent change after elective gastric surgery, and that this dilatation was progressive in perhaps half our cases. The increase in gallbladder volume was an unexpected finding.

The follow-up is being continued to ascertain the dura-tion of this dilatation.

The volume of the gallbladder can be computed accurately (Boyden 1928, Siffert de Paula e Silva 1949). The table shows measured gallbladder volumes in 4 of our cases after routine partial gastrectomy without vagotomy.

Emptying-rate of Gallbladder After Milk-and-egg Mixture

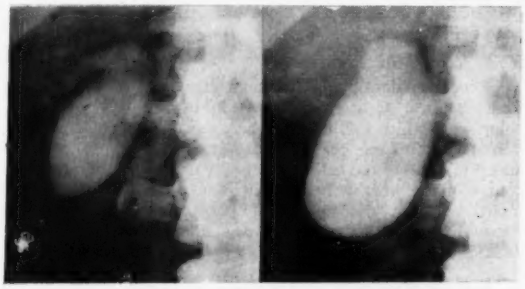
Partial gastrectomy (antecolic anastomosis with spur).—9 cases. In 7 cases there was a preoperative and an immediate postoperative series; the emptying-rate was un-changed in 2 cases and increased in 5; the increase was striking in 3 of these 5.

In 6 cases there was an immediate and a late postoperative series. In the second postoperative series, the emptying-rate was further increased in 4 cases, the increased emptying seen in the immediate postoperative series was maintained in 1 case,

MEASURED GALLBLADDER VOLUME IN THE TWO-HOUR BILIGRAFIN FILM

Case	Sex, age, lesion	Radiograph series	Gallbladder		Comments
			Volume (ml.)	Position	
1	F. 42 G.U.	First post-operative	18·2	Normal	The gallbladder more than doubled its volume in the 10 months after partial gastrectomy
		Second post-operative (10 months)	49·7	Unchanged	
2	M. 56 G.U.	Preoperative	51·2	Normal	Over 50% increase in gallbladder volume after partial gastrec-tomy
		First post-operative	82·1	Unchanged	
3	M. 58 D.U.	Preoperative	40·5	Normal	The gallbladder doubled its volume after partial gastrec-tomy. No pro-gressive increase
		First post-operative	83·5	Lower	
		Second post-operative (9 months)	71·8	Lower	
4	M. 51 D.U.	Preoperative	32·3	Normal	Progressive increase in volume after par-tial gastrectomy, the final volume being more than double the initial
		First post-operative	40·6	Unchanged	
		Second post-operative (10 months)	73·7	Unchanged	

D.U., duodenal ulcer; G.U., gastric ulcer. The operation in each case was partial gastrectomy; Schoemaker in case 1 and Billroth type II, with antecolic anastomosis and spur, in the others.



(a) (b)

Fig. 1—Case 1. Intravenous cholecystogram, 2-hour film. (a) 10 days after operation; gallbladder volume 18·2 ml. (b) 10 months later; volume 49·7 ml.

and the unchanged rate in the immediate postoperative series remained unchanged in 1 case.

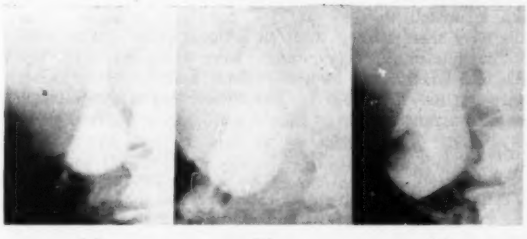
Partial gastrectomy (Schoemaker).—2 cases, with an immediate postoperative and late postoperative series in each. In 1 case in the late postoperative series the rate was increased; in the other there was no change.

Partial gastrectomy and vagotomy.—4 cases, with a preoperative and late postoperative series in each case. In 3 cases the emptying-rate was increased and in 1 there was no change.

Vagotomy and posterior gastroenterostomy.—3 cases, with three series of films in each. In 1, the emptying-rate was unchanged in both postoperative series. In the remaining 2, the first postoperative series showed no change in 1 case, and a slower emptying-rate in the other. The second postoperative series in each case showed an increase in emptying-rate compared with the preoperative series.

In 15 cases there was an immediate preoperative and one postoperative series; in 11 of these the emptying-rate of the gallbladder was increased after a fatty meal. This increase is mainly limited to the ten-minute and fifteen-minute films, showing that the emptying begins earlier and is more active than before operation. Dilatation of the gallbladder and increase in emptying-rate must be accepted as unrelated changes, because not all gallbladders that are dilated have shown an increase in emptying-rate, and the emptying-rate has increased in undilated gallbladders. No film has shown dilatation of the common duct, at the time of either dilatation or emptying of the gallbladder. There has therefore been no indication at any time of contraction or failure of relaxation of the sphincter at the lower end of the common duct.

The changes in the gallbladder after elective gastric surgery are dilatation, which is often progressive, and an increase in emptying-rate. The gallbladder has apparently moved downwards, by the width of one lumbar vertebra, in 2 cases. The doubling in volume of the gallbladder in



(a) (b) (c)

Fig. 2—Case 4. Intravenous cholecystogram, 2-hour film. (a) 7 days before operation; gallbladder volume 32·3 ml. (b) 10 days after operation; volume 40·6 ml. (c) 10 months after operation; volume 73·7 ml.

12 days after simple gastrectomy is one of the most striking concomitant physiological changes seen in all abdominal surgery.

Correlation of Changes in the Gallbladder with the Incidence of "Dumping" and Bilious Vomiting

In these 18 patients there has been 1 case of "dumping"—vertigo, leg weakness, and sweats—developing eleven months after partial gastrectomy, and 1 of minor bilious vomiting developing nine months after a Schoemaker partial gastrectomy. This bilious vomiting lasted only two months. In the patient with "dumping" the immediate postoperative film showed that the gallbladder had doubled its size with an increase in emptying-rate. There was no change, however, in the late postoperative film nine months after operation. As the "dumping" developed eleven months after operation, it is almost certain that there were no associated changes in the gallbladder. In the patient with bilious vomiting, the gallbladder had doubled its volume (though it could still actively contract) during the ten months after operation. The bilious vomiting developed nine months after operation, that is, at a time when gallbladder changes were taking place. It is therefore possible that these changes in the gallbladder caused or exaggerated the minor degree of bilious vomiting in this case. But in fully developed bilious vomiting the amount of fluid lost is substantial. It is unlikely that the release of a relatively small additional volume of bile by active contraction of a dilated gallbladder can be a determining factor in the production of striking bilious vomiting.

Discussion

It seems certain that the emptying-rate of the gallbladder depends on that of the stomach. This sequence will account for all the changes in the emptying-rate of the gallbladder reported above after elective gastric surgery. The remaining problem is to explain the dilatation of a gallbladder that has retained its ability to contract.

Fulton (1955) writes:

"When both vagi are cut, the gallbladder responds to the egg-yolk meal in its normal manner, suggesting that in the absence of the parasympathetic innervation the hormonal mechanism is sufficient to cause normal evacuation of the gallbladder."

Johnson and Boyden (1952) conclude that:

1. Complete severance of the vagi results in progressive enlargement of the gallbladder. They found the fasting volume approximately doubled by complete vagotomy.

2. The vagi are not essential to evacuation of the human gallbladder, and emptying is regulated primarily through a hormonal mechanism.

It is clear from Mitchell's (1953) diagrams that the vagus supply to the gallbladder runs very close to the left gastric artery, in the cœliac division of the posterior vagus, and in the gastrohepatic omentum. In view of this, it is highly probable that the vagus supply to the gallbladder will be severed once, if not twice, in a routine partial gastrectomy.

Both formal vagotomy and partial gastrectomy therefore produce dilatation of the gallbladder. It seems certain that this dilatation is caused by section of its vagal supply during partial gastrectomy.

In a paper published in December, 1956, when this work was nearly complete, Scott and Whiteside drew attention to the presence of an enlarged gallbladder in 7 cases of postgastrectomy bilious vomiting. No attempt

was made to explain this finding. It will have been noted that none of our patients had well-established post-gastrectomy bilious vomiting.

One additional thought may be committed to paper. It seems that, after partial gastrectomy, an excessive amount of cholecystokinin is liberated and causes a very dilated gallbladder to contract to a very small size in ten to fifteen minutes. It seems possible that some such active substance, liberated in excess by a fatty meal, may " spill over " into the general circulation and produce the " dumping syndrome ". An investigation of the portal stream would throw light on this point.

Summary

Gallbladder function after elective gastric surgery has been investigated in 18 patients by means of intravenous cholecystography.

The characteristic changes are a dilatation of the gallbladder that is sometimes progressive and an increase in its emptying-rate after a fatty meal.

The dilatation is probably caused by section of the vagus nerves, and the emptying-rate of the gallbladder probably depends on that of the stomach.

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IMPROVED METHOD OF LABELLING RED CELLS WITH RADIOACTIVE PHOSPHORUS

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WHEN radioactive phosphorus is added to heparinised blood and the mixture is then incubated at 37°C, about 30% of the ^{32}P is incorporated in the red cells during the first hour (Hevesy et al. 1944, Reeve and Veall 1949, Wilklander 1956). In the course of experiments on the metabolism of red cells in this laboratory it was found by chance that the uptake of ^{32}P by red cells washed in citrate was very much more rapid than this. We report here the results of an investigation of the factors concerned in this rapid uptake and describe an improved method of labelling red cells with ^{32}P.

Preparation of Red Cells

Red cells were obtained from blood freshly drawn into a heparinised syringe. The blood was transferred to a screw-capped glass container and centrifuged. The plasma was taken off into a new container; most of the red cells were sucked up from the bottom of the container so as to leave behind as much as possible of the buffy coat; the red cells were then mixed with their own plasma to give blood poor in white cells. 2 ml. quantities of this blood were used and, as an approximation, it was taken that each 2 ml. contained 1 ml. of red cells. In some experiments the blood was simply packed by centrifugation and the supernatant fluid was discarded before ^{32}P was added to the packed cells. In other experiments the red cells were washed by adding about 20 ml. of a wash solution to the 2 ml. of blood; after centrifugation the supernatant fluid was discarded and the cells were re-suspended by adding 1 ml. of one of a series of solutions which were being tested.

Radioactive Phosphorus

^{32}P was usually obtained without carrier (P.B.S.1 from the Radiochemical Centre) and was diluted in 0·9% sodium chloride, to which sodium phosphate was added in a concentration of about 0·1 mg. per ml. as carrier. The volume of solution added to 1 ml. of red cells was initially 0·1–0·5 ml. During the course of the work it became apparent that sodium chloride interfered with the uptake of phosphorus; therefore the ^{32}P with high specific activity was diluted in the following solution:

Trisodium citrate 3·0 g.
Sodium di-hydrogen phosphate ($NaH_2PO_4 2H_2O$) 0·015 g.
Glucose 0·2 g.
Water to 100 ml.

This solution, which has a pH of about 6·9, is referred to as citrate-phosphate.

The diluted ^{32}P solution used in the uptake experiments contained about 5 μC per ml. The ^{32}P solution used for labelling red cells for estimation of the red-cell volume contained about 20 μC per ml.

Solutions Used for Washing or Resuspending Erythrocytes

To each of the following solutions, glucose in a concentration of 200 mg. per 100 ml. was added; but, to save repetition, the presence of glucose in the solutions is not mentioned in referring to them subsequently.

Citrate-phosphate.—This solution was the one described above.

Saline-phosphate.—1·0% sodium chloride with 0·015% sodium dihydrogen phosphate (pH 6·8).

Saline.—0·9% sodium chloride.

Potassium chloride.—1·14% KCl (this concentration was chosen as being isotonic with 0·9% NaCl).

Citrate.—3·0% trisodium citrate.

Citrate-saline.—1·0% trisodium citrate in 0·9% NaCl. Similarly citrate-KCl was 1·0% trisodium citrate in 1·14% KCl.

Sodium sulphate.—1·7% anhydrous sodium sulphate.

Sucrose.—6% sucrose. This concentration was chosen because in a lower concentration, such as 4%, the red cells were hæmolysed, and in a higher concentration, such as 10%, they tended to sludge.

Sucrose-saline, containing 4% sucrose and 0·6% NaCl, was also tested; in a further experiment 6% sucrose to which 0·1% calcium-chloride had been added was also tested (*sucrose with $CaCl_2$*).

E.D.T.A.—3% ethylene diamine tetra-acetic acid (disodium salt).

Estimation of Rate of Glycolysis

Fresh red cells from heparinised blood were washed either in citrate-phosphate or in saline-phosphate. One volume of cells was then resuspended in an equal volume of the solution in which the cells had been washed, and the mixture was incubated at 37°C for one or two hours. The glucose concentration of each mixture was estimated by Nelson's (1944) method before and after incubation. The hæmoglobin concentration of the mixtures was also estimated, and from this the packed-cell volume was deduced.

Localisation of ^{32}P in Phosphate Compounds of Red Cells

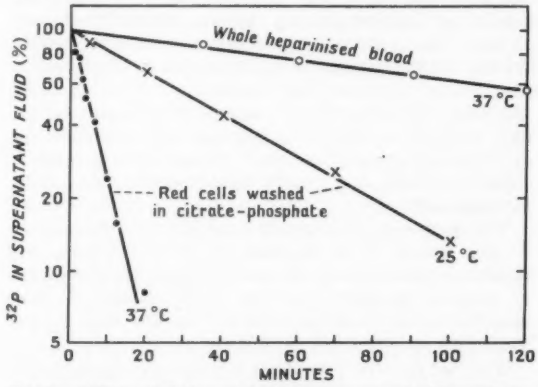
Red cells were washed once in citrate-phosphate and were then incubated with ^{32}P at 37°C for thirty minutes. The cells were then washed twice in ice-cold saline. The acid-soluble phosphorus compounds were extracted from the cells and fractionated by the method described by Hughes Jones and Robinson (1957). The ^{32}P content of the fractions was also estimated.

Estimation of Red-cell Volume

About 20 ml. of blood was drawn into a heparinised syringe. 10 ml. was placed in an empty container, and the other 10 ml. was mixed with A.C.D. 3 ml. Both samples were spun. About 1 ml. of red cells was taken from the heparinised sample; the cells were aspirated from the bottom of the container so as to avoid the buffy coat. The cells were washed once in 20 ml. of citrate-phosphate solution. Then to the packed cells was added 2–3 μC of ^{32}P diluted in a volume of

0·1–0·4 ml. of citrate-phosphate solution. The mixture was placed in a water-bath at 37°C for thirty minutes (fifteen minutes in one experiment). The cells were then washed twice in ice-cold isotonic saline and finally resuspended in about 10 ml. of saline solution and added to washed ^{51}Cr-labelled cells (see below).

The sample of blood mixed with A.C.D. was centrifuged and the supernatant fluid discarded. To the packed cells about 50 μC of ^{51}Cr was added and well mixed. The mixture was left at room temperature for about thirty minutes. The cells were then washed twice in saline solution, resuspended in about 10 ml. of saline solution and added to the suspension of ^{32}P-labelled cells. The mixed suspension of ^{32}P-labelled and ^{51}Cr-labelled cells was then made up to a volume of about 25 ml. with saline solution and kept cold until the time of injection. 20 ml. was injected from a calibrated syringe, and three or four samples of blood were taken from the opposite arm from about ten minutes after injection to about sixty or seventy minutes after injection. The packed-cell volume of each sample was determined in duplicate, and the values were corrected for trapped plasma. The ^{32}P values, as counts per minute per ml. of red cells in each sample, were then plotted on semilogarithmic paper, and the best straight line was fitted to the points by eye. From the line the value at 0 minutes was deduced. In the case of the ^{51}Cr values it was assumed that there was no significant loss of ^{51}Cr from the circulation



Uptake of ^{32}P in whole heparinised blood compared with uptake by red cells washed in citrate-phosphate (3% citrate with 0·015% sodium dihydrogen phosphate, see text).

during the period of observation, and the ^{51}Cr value was therefore taken as the mean of all the samples expressed in terms of counts per ml.

Results

The accompanying figure shows the uptake of ^{32}P by red cells washed in citrate-phosphate, compared with the uptake in whole heparinised blood. In cells washed in citrate-phosphate, and resuspended in citrate-phosphate, uptake is a simple exponential process with a half-time of five minutes at 37°C, and of thirty-five minutes at 25°C. By contrast, in heparinised blood half the ^{32}P is taken up, at 37°C, in two and a half hours. The rate of uptake of ^{32}P in red cells washed in citrate-phosphate and left in citrate-phosphate at +4°C is not shown because it was negligible (less than 2% in twenty-four hours).

Some of the results of experiments designed to elucidate the above-mentioned findings are set out in tables I–III; all the experiments were made on at least two separate occasions, and all the results are mean values derived from at least two experiments.

When ^{32}P was added directly to packed red cells obtained from heparinised blood, the rate of uptake was considerably increased; thus 79% of ^{32}P was incorporated in the red cells in thirty minutes at 37°C. When 0·2 ml. of plasma was added to 1 ml. of red cells before the ^{32}P was added, the uptake was 42%; the addition of 1 ml. of heparinised plasma to 1 ml. of red cells reduced the uptake to 12%. The addition of 1 ml. of 0·9% NaCl to 1 ml. of cells reduced the uptake to a similar level. On the other hand, the addition of 1 ml. of citrate or of citrate-phosphate to 1 ml. of cells led to a greatly increased uptake of ^{32}P; the effect of 1% citrate in 0·9% NaCl was intermediate (see table I).

TABLE I—UPTAKE OF ^{32}P BY RED CELLS FROM HEPARINISED BLOOD RESUSPENDED IN VARIOUS SOLUTIONS

Solution added to 1 ml. of packed red cells		Uptake of ^{32}P (%)*
Volume (ml.)	Composition	
Nil	—	79
0·2	Plasma	42
1·0	,,	12
1·0	Saline	10
1·0	Citrate	60
1·0	Citrate-phosphate	57
1·0	Citrate-saline	30

* After 30 minutes at 37°C.

Effect of Washing Red Cells in Citrate-phosphate

In a series of experiments red cells from 2 ml. of heparinised blood were washed once in 20 ml. of citrate-phosphate solution. The supernatant fluid was then removed, and the red cells were resuspended into various solutions; the results are summarised in table II.

The addition of ^{32}P to packed red cells washed in citrate-phosphate invariably led to rapid and complete uptake of ^{32}P. Thus in eight experiments the average uptake after thirty minutes at 37°C was 98%. When 0·5 ml. of citrate-phosphate solution was added to the cells before ^{32}P was added, the uptake was slightly reduced; but even after the addition of 1 ml. the uptake was still 87%. On the other hand, when saline solution was added to the cells, the uptake was greatly reduced; thus the addition of only 0·2 ml. of saline solution to 1 ml. of cells reduced the uptake to 51%, and the addition of 1 ml. reduced the uptake to 11%. When citrate-saline rather than saline solution was added, the uptake was almost as poor as in saline solution alone. The addition of KCl produced effects indistinguishable from those of NaCl.

Red Cells Washed in Other Solutions

When red cells were washed in sodium sulphate, saline, or sucrose-saline and then resuspended in an equal volume of solution, the uptake was 24–34%. On the other hand, when red cells were washed in 6% sucrose or in 3% E.D.T.A. and then suspended in 0·5 to 1 ml. of the same solution, the uptake was very high

TABLE II—UPTAKE OF ^{32}P BY RED CELLS WASHED ONCE IN 20 VOLUMES OF CITRATE-PHOSPHATE SOLUTION AND RESUSPENDED IN VARIOUS SOLUTIONS

Solution added to 1 ml. packed red cells		Uptake of ^{32}P (%)*
Volume (ml.)	Composition	
Nil	—	98
0·5	Citrate-phosphate	92
1·0	,, ,,	87
0·2	Saline	51
0·4	,,	32
0·5	,,	22
1·0	,,	12
0·5	Citrate-saline	23
1·0	,, ,,	17
0·5	KCl ,, ,,	18
1·0	,,	10
0·5 ml.	Citrate-KCl	20
1·0 ml.	Citrate-KCl	12

* After 30 minutes at 37°C.

TABLE III—UPTAKE OF ^{32}P BY RED CELLS WASHED ONCE IN 20 VOLUMES OF SOLUTION AND RESUSPENDED IN VARIOUS SOLUTIONS

Wash solution	Solution added to 1 ml. of packed red cells		^{32}P (%) *
	Vol. (ml.)	Composition	
Sodium sulphate	1·0	Sodium sulphate	28
Saline	Nil	—	74
,,	1·0	Saline	27
,,	1·0	Citrate	66
Sucrose-saline	Nil	—	73
,, ,,	1·0	Sucrose-saline	24
Sucrose	0·5	Sucrose	98
,,	1·0	,,	99
,,	0·5	Sucrose with $CaCl_2$	98
E.D.T.A.	1·0	E.D.T.A.	97

* After 30 minutes at 37°C.

(97%). The addition of 0·01% $CaCl_2$ to 6% sucrose did not diminish the uptake (see table III).

Rate of Glycolysis

In citrate-phosphate the rate of utilisation of glucose at 37°C was about 30 mg. per 100 ml. of red cells per hour, and this did not differ significantly from the rate observed in saline-phosphate.

Localisation of ^{32}P in Phosphate Compounds Within Red Cells

As described above, cells washed in citrate-phosphate and then incubated with ^{32}P at 37°C were analysed. 85% of the ^{32}P was present in the fractions containing adenosine triphosphate and 2:3 diphosphoglycerate. The remaining 15% was distributed almost equally between the fractions containing adenosine diphosphate and fructose diphosphate and the fractions containing adenosine monophosphate, inorganic phosphorus, and sugar monophosphates.

Rate of Loss of ^{32}P in vitro from Labelled Red Cells

The rate of loss of ^{32}P from red cells labelled by the "new" way (i.e., previous washing in citrate-phosphate) was compared with the rate of loss from red cells labelled in the "old" way (simple addition of ^{32}P to heparinised blood). The cells were in each case incubated at 37°C with ^{32}P for thirty minutes, washed twice in ice-cold saline solution, and then resuspended in half their volume of heparinised plasma and reincubated at 37°C. The loss from red cells labelled in the new way was a little greater than that from red cells labelled in the old way —e.g., after an hour about 8% and 4% respectively.

Rate of Loss of ^{32}P in vivo from Labelled Red Cells

Tests were made on seven people: 5 healthy volunteers and 2 patients with leukæmia. The results are shown in table IV. The agreement between the ^{51}Cr results and the results obtained by the "new" method of ^{32}P labelling was extremely close. Thus, if the ^{51}Cr value is taken as 100%, the mean ^{32}P value was 100·05%, and the coefficient of variation of the ^{32}P results was 0·9%. As table IV also shows, the loss of ^{32}P in the first sixty minutes after injection was 10%.

TABLE IV—RESULTS IN VIVO: COMPARISON OF ^{32}P LABELLING OF RED CELLS WITH ^{51}Cr LABELLING: LOSS OF ^{32}P IN 60 MINUTES FOLLOWING INJECTION

Case no.	^{32}P counts at 0 min. as % of ^{51}Cr counts	^{32}P counts at 60 min. as % of ^{32}P counts at 0 min.
1	100·0	91
2	101·3	89
3	100·3	91
4	98·9	90
5	99·9	89·5
6	99·0	—
7	100·9	89·5
Mean	100·05	90

Discussion

Although it is usually held that the uptake of phosphate by red cells depends closely on glycolysis, it is clear that the greatly accelerated uptake observed in cells washed in citrate cannot be directly related to an increase in glycolysis. Thus, cells washed in citrate take up ^{32}P about thirty times more rapidly than do cells in heparinised plasma, although their rate of glycolysis is not increased. Similarly, cells washed in E.D.T.A. take up ^{32}P very rapidly, although in such an acid solution glycolysis must be depressed.

The results suggest that the most important factor in the acceleration of uptake is the amount of penetrating anion present in relation to the volume of red cells. Thus, packed red cells from heparinised blood take up phosphate well, but the addition of only a fifth volume of plasma to the packed red cells reduces the uptake from about 80% to 40%, and red cells suspended in an equal volume of plasma have an uptake of only 12% (all these figures refer to the uptake after thirty minutes' incubation at 37°C). The effect of isotonic saline, potassium chloride, and sodium sulphate solutions is very like that of plasma. On the other hand, E.D.T.A. has an effect very like that of citrate. These latter substances appear to act simply as non-penetrating anions, because sucrose, which is also a substance which does not readily penetrate the red-cell membrane, has the same effect. This suggests that anions such as chloride and sulphate normally compete with phosphate for some transport mechanism and that the uptake of phosphate can therefore be improved by any means which reduces the amount of these competing anions in the fluid in which the red cells are suspended.

The improvement in uptake produced by citrate cannot be due simply to the binding of calcium, because the uptake is rapid in the presence of physiological amounts of calcium, provided that the concentration of other electrolytes has been reduced by washing (see experiment with sucrose-CaCl in table III).

The fact that the phosphate is firmly incorporated into organic phosphates within the red cell, even when the uptake is very rapid, is shown by the analyses of radioactivity in organic phosphate compounds. Similarly, the fact that the uptake is seven times as rapid at 37°C as at 25°C and that it is virtually arrested at +4°C shows that it does not simply depend on diffusion into the red cells but is an active process.

Further evidence on this point is supplied by the observation that glycerol in a concentration of about 6 molar inhibits glycolysis and also inhibits the uptake of ^{32}P in red cells previously washed in citrate (Jones et al. 1957).

Estimates of red-cell volume by the new rapid uptake method of ^{32}P agreed very closely with simultaneous estimates made with ^{51}Cr. The loss of ^{32}P from the red cells during the first hour after injection (10%) hardly differed from that observed after injecting red cells labelled in the usual way (Mollison 1956).

In a previous paper from this laboratory estimates of red-cell volume, using ^{51}Cr and ^{32}P (Reeve and Veall 1949), were made in 14 people. The ^{32}P estimates were higher in 8 and lower in only 2 people (Mollison and Veall 1955). It now seems that most of this discrepancy was due to failure to apply a correction to the ^{32}P standards —to take into account the fact that the standards were diluted in water. When solutions of radioactive phos-

phorus are diluted in blood, as they should be for strict comparison with the samples of blood, their counting-rate is about 0·98 times the rate observed when they are diluted in water. If this correction factor had been applied to the previous results, the agreement between the ^{32}P and ^{51}Cr results would have been almost exact. It remains true, as pointed out in the previous paper, that the ^{32}P method is liable to give overestimates of red-cell volume because of the tendency of ^{32}P to adhere to particles of dust, white cells, bacteria, &c. One advantage of the much more rapid uptake obtained when the red cells are first washed in citrate is that virtually all the activity is incorporated in the red cells, and thus errors from injecting ^{32}P attached to other particles is negligible.

Summary

When cells are washed once in citrate and are then incubated with radioactive phosphorus at 37°C, the rate of uptake of phosphorus is very rapid, the process having a half-time of about five minutes. This acceleration over the rate normally obtained seems to be due to the removal of competing anions, since it is also produced when the red cells are washed in sucrose.

Red cells labelled in this way may conveniently be used for estimating the red-cell volume, because the rate of loss of ^{32}P from such labelled red cells is not significantly more rapid, either in vitro or in vivo, than that observed when red cells are labelled in the usual way.

This method of labelling is considerably more convenient than that currently in use. Not only is it more rapid but also it is more complete; hence the red cells need less washing. Very close agreement with simultaneous estimates made by the ^{51}Cr method was observed in 7 cases.

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UNILATERAL RENAL INJURY DUE TO TRANSLUMBAR AORTOGRAPHY

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THE risks attending translumbar aortography have recently been discussed (*Lancet* 1957, Trippel et al. 1957) and the major complications reviewed (Crawford et al. 1957). The renal complications of aortography have received considerable attention, and ten deaths from renal failure have been reported by Crawford et al. (1957) and Conger et al. (1957). Crawford et al. consider renal injury to be the commonest significant complication and refer to 12 cases of unilateral renal damage, adding a further personal case. There are few reports in British literature on renal complications following aortography. Riches (1955) mentions a case of renal failure with recovery, and Roy (1957) and Dormandy et al. (1957) give details of 2 further cases. The following case is reported because severe unilateral renal damage was sustained which was entirely asymptomatic.

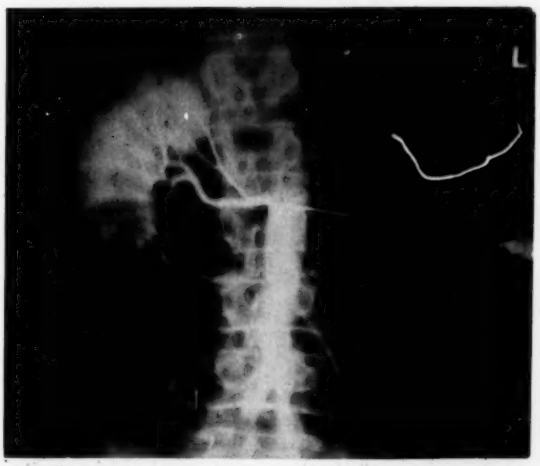

Fig. 1—Needle has entered lumen of right renal artery, tip of needle lying at mouth of arterial branch to upper pole. Aberrant renal artery supplies lower pole.

Case-report

A merchant seaman, aged 64, was admitted to hospital on May 7, 1957, with seven years' history of intermittent claudication affecting his right leg. At first confined to his calf it had recently spread to his thigh, exercise tolerance being limited to about 50 yards. His foot felt cold and numb, but he had not noted any change in its colour. His past medical history was not significant; he had smoked twenty cigarettes a day since adolescence.

On examination he was well built, healthy-looking, and inclined to obesity. His heart was normal clinically, his blood-pressure 145/85 mm. Hg, and his radial pulse regular, with some thickening of the vessel wall. All peripheral pulses, including the femoral, were absent from his right leg, and only the dorsalis pedis artery was impalpable in his left leg. Thrombosis of either his right common iliac artery or his right external iliac artery was diagnosed.

Translumbar aortography was done on May 8, 1957, under thiopentone anæsthesia. 50 ml. of 70% sodium acetrizoate ('Diaginol') was injected by the one-needle technique using a mechanical pressure apparatus. The aortogram is shown in fig. 1. The contrast medium had been injected directly into the right renal artery, and the aorta filled by overflow. Occlusion of the right common iliac artery and part of the external iliac artery was confirmed. The distal part of the external iliac artery and the femoral artery were patent.

Progress.—After aortography the patient's urine was examined daily, but no abnormal constituents were found, and its specific gravity varied from 1·018 to 1·024. There were no symptoms or signs of injury to the right kidney. The output of urine was never less than 800 ml. in twenty-four hours, and the blood-urea level was 40 mg. per 100 ml. Although there was no positive evidence of renal damage, it seemed advisable to postpone intravenous urography rather than subject the kidneys to further exposure to organic iodide. The patient was discharged on May 14, there being no suitable homograft then available.

Readmission.—He was readmitted on June 10, and intravenous pyelography was done, which showed a normal left kidney but poor concentration in the right (fig. 2). The urine did not contain albumin, cells, or casts, and its specific gravity was 1·022. The blood-urea level was 41 mg. per 100 ml. and the blood-pressure 146/80 mm. Hg. Next day an aortofemoral shunt homograft was inserted to bypass the thrombosed segment. Postoperatively the posterior tibial pulse became palpable and has remained so. The patient was discharged from hospital on June 30.

Fig. 2—Renal function impaired on right side.

Follow-up.—On Oct. 5 the ureters were catheterised, and indigo-carmine was injected intravenously. The dye appeared from the left ureter after six minutes and showed good concentration at the end of an hour. On the right side there was no obvious excretion of dye at this time. The patient was in good health, and the graft was functioning. The blood-urea level was 38 mg. per 100 ml.

Discussion

The present case illustrates one of the well-recognised complications of aortography and is of special interest in view of the absence of clinical manifestations. If the implications of direct injection of organic iodide into the renal artery had not been appreciated, the lesion would possibly have gone unrecognised.

In 5 of the 13 published cases of unilateral renal injury complete recovery apparently took place, the 8 others showing either no function or reduced function. In the first case an unstated volume of sodium iodide was accidentally injected into the left renal artery; this was followed by pain in the left loin for forty-eight hours, but subsequently phenolsulphonephthalein was excreted normally by the left kidney (Melick and Vitt 1948). In all the other cases the injury was to the right kidney, which is anatomically more susceptible to damage.

The factors responsible for renal damage in aortography are considered to be misdirection of the needle, multiple injections, excessive pressure or volume, drug sensitivity, or a combination of two or more of these factors (Miller et al. 1954). In all the unilateral cases the needle has been directed toward the origin of the renal artery or has lain within its lumen. This hazard is avoidable if the practice of making "scout" injections is adopted as a standard part of the procedure. Multiple injections are to be avoided, particularly repeated aortic punctures, as shown by Crawford et al. (1957). All the cases of serious hæmorrhage following aortography have been associated with multiple aortic punctures or change in position of the patient with the needle still in place.

The use of mechanical apparatus to inject contrast media under pressure has received considerable criticism. Many clinics obtain satisfactory films by manual pressure only, and in view of the dangers of aortic dissection, emphasised by Gaylis and Laws (1956), it seems advisable to abandon this technique.

Toxicity and idiosyncrasy are difficult to assess. Iodism does not appear to be a serious problem, and there have been no deaths from anaphylaxis. Organic iodides, however, are harmful in another way, either by destroying tissue directly or by producing ischæmia, and the dosage, concentration, and type of compound responsible for this seem to vary. As little as 15 ml. of 70% solution of sodium acetrizoate ('Urokon') has been known to impair renal function (McAfee and Willson 1956) and was the medium used in 12 of the cases of unilateral lesions and in many of the bilateral cases.

Goodwin (1957) has therefore abandoned sodium acetrizoate in favour of 50% sodium iodomethamate U.S.P. ('Neo-iopax'), although it has been responsible for 1 death (Josselson and Kaplan 1954), and 1 case of unilateral renal injury (Harvard 1953).

80% sodium iodide, so notorious as a cause of death from thrombosis of the superior mesenteric artery in aortography, has been injected directly into the right renal artery without apparent effect (Maluf and McCoy 1955), but a patient cited by Crawford et al. (1957) died of bilateral renal injury following the injection of only 15 ml. of sodium iodide. Idbohm (1956) considers that the use of sodium iodide in renal angiography is unjustifiable.

The tolerance to other iodine compounds varies widely from one person to another, and the concentration of the drug is important in this respect (Idbohm and Berg 1954), as well as the type of compound used.

So far as renal angiography is concerned, the techniques of selective angiography described by Ödman (1956), Edholm and Seldinger (1956), Tillander (1956) and Gregg et al. (1957) seem to offer a measure of safety, but translumbar aortography, still necessary in the investigation of peripheral vascular disease, probably requires a safer contrast medium than is at present available.

Summary

A case of unilateral renal injury following translumbar aortography is reported.

There was no clinical indication of renal damage.

The factors responsible for this lesion are discussed, and the conclusion is drawn that a safer contrast medium is required.

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CARDIAC SYNCOPE AFTER SWALLOWING

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THIS report describes a patient who had many attacks of cardiac syncope immediately after swallowing food or fluids. A midœsophageal diverticulum was found. Two descriptions of similar cases have been published (Weiss and Ferris 1934, Correll and Lindert 1949), but the syndrome is rare and interesting enough to merit a third.

Case-report

In October, 1955, a lorry driver, aged 58, had pain in his chest while loading a lorry. The pain passed off with rest but recurred two days later. On each of the three following days it came on while he was at rest; it was severe and accompanied by vomiting, and each attack lasted progressively longer, until finally pain persisted all night.

On admission to hospital on Oct. 11, 1955, short of breath and cyanosed, he showed signs of heart-failure: his pulse-rate was 120, pulse regular, and blood-pressure 95/70 mm. Hg. Loud pericardial friction was heard. Electrocardiography showed an extensive transmural anterior myocardial infarct. Radiography of his chest showed that his heart was enlarged.

Treatment and progress.—He was given digitalis, mersalyl, and anticoagulants and improved steadily. Ventricular extrasystoles appeared and were sometimes numerous. Thirteen days after admission, while being fed with a breakfast of boiled egg, he suddenly fell back unconscious on his pillow; he threw his arms outwards, and his eyes turned up. He recovered in about a minute. Questioned afterwards, he remembered having had a short attack of unconsciousness forty years before, which he thought had occurred while he was at lunch. Otherwise his convalescence was uneventful. He was discharged on Nov. 21, 1955, free from heart-failure and still taking digitalis folia gr. 1 daily.

Readmission.—In August, 1957, he was sent for consultation because of attacks of fainting. These had started soon after his discharge from hospital; at first they had been infrequent but latterly almost daily. Without exception they had come on while he was either eating or drinking. They were slightly less common with liquids than with solid food, and it made no difference whether the food was hot or cold. His wife said that she had come to be afraid to put food before him. Immediately after swallowing he would feel discomfort which began behind the lower end of his sternum, and seemed to rise towards his throat. Sometimes he would feel faint without losing consciousness; in a more severe attack he would suddenly become unconscious. His wife said that at the beginning of the attack his face would become pale; while he was unconscious his eyes turned up, and he might have a convulsion sufficiently violent to knock the meal off the table. Sudden flushing of the face heralded his return to consciousness. The attacks lasted from one to five minutes, tending to last longer as time passed. Apart from these attacks the patient had been well, was no longer breathless, and had no pain in his chest. He was still taking digitalis.

On examination there were no signs of heart-failure; his pulse-rate was 72, and pulse regular; a soft systolic murmur was heard at the apex; and his blood-pressure was 120/80 mm. Hg. Pressure on either carotid sinus slowed the pulse but caused no faintness. Electrocardiography showed inverted T waves in leads S_1, *a* VL, and V_{3-7}—presumably a sequela of the infarction. There was sinus rhythm except for rare multifocal ventricular extrasystoles; the P-R interval was 0·14 sec. Pressure on either carotid sinus slowed the pulse-rate from 75 to 45 per min. and caused the P wave in the only lead examined (SIII) to become biphasic; the P-R interval was not altered. The effect of drinking cold water for about 5 seconds was then observed three times. The first drink caused asystole lasting 5·6 seconds. This was preceded by three beats in which no P waves were visible in the tracing, which was somewhat disturbed by the activity of drinking. The ventricular complexes were unchanged. At the end of the asystole six beats passed before the P waves reappeared, and of these the second was a ventricular extrasystole. The second and third drinks produced changes similar to those caused by sinus pressure; the heart beat did not again stop. Radiography of the chest showed only slight cardiac enlargement. A barium swallow showed a traction diverticulum of the œsophagus at the level of the bifurcation of the trachea (fig. 1).

Treatment and progress.—The digitalis was stopped, and the patient was given ephedrine, gr. $^1/_2$ t.d.s. During the subsequent eight weeks he had no attacks of fainting, although he sometimes had momentary discomfort in his chest while eating.

Investigation with balloon.—An observation was made (after stopping the ephedrine for two days) in which a balloon 6·3 cm. long and 3·4 cm. in diameter was placed in the œsophagus; inflation of it with 20–30 ml. of air caused, in severe form, the same retrosternal discomfort which initiated his attacks of fainting. With the balloon at the level of the diverticulum the first inflation caused heart-block for three beats, slowing the auricular rate from 88 to 52 without altering the P waves (fig. 2). A second inflation caused heart-block for two beats. The balloon was then moved to a point 4 inches below the diverticulum, the position being checked radioscopically. The first inflation at this site caused heart-block for one beat, followed by a lengthening of P-R interval for three beats; a second inflation only slowed the rate. The balloon was then inflated ten times at the lower site and five times at the level of the diverticulum, the heart beat being observed by auscultation; each inflation slowed the rate, but there were no missed beats.

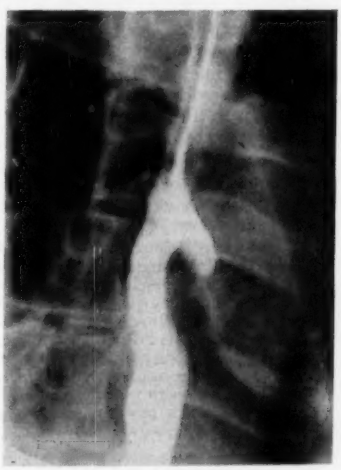

Fig. 1—Barium swallow, showing traction diverticulum of œsophagus at level of tracheal bifurcation.

Discussion

Except that his attacks (with one possible exception) followed a myocardial infarction, this patient closely

Fig. 2—Lead V_5. During the period indicated by the black line above the tracing a balloon was being distended in the œsophagus at the level of the diverticulum.

resembles those described by Weiss and Ferris (1934) and Correll and Lindert (1949). The œsophageal diverticulum presumably causes the attacks by becoming distended with food and drink, although it has not been shown either in the present patient or in those cited that such distension is the stimulus. Weiss and Ferris showed that blocking the vagi in the neck abolished the cardiac response to œsophageal distension; therefore the response was not due to stimulation of motor vagal fibres.

In the present patient œsophageal distension did not always cause the same disturbance of conduction. Sometimes sinu-auricular block resulted and sometimes auriculo-ventricular block; either change could cause ventricular standstill. The change in shape of the P waves during drinking was presumably due to a shift of the pacemaker; a similar effect was observed by Correll and Lindert.

A further question is why the attacks started after the myocardial infarction. This lesion may have altered the sensitivity of the cardiac impulse to vagal control, or made ventricular escape more difficult. A more likely explanation is that the heart was sensitised by digitalis. Correll's and Lindert's patient started having attacks eight months after being digitalised, and it was no longer possible to produce faintness by distending the œsophagus after stopping digitalis.

The description by Adams and Stokes of fainting attacks accompanied by slowness of the pulse were antedated by three others.

Thomas Spens (1793) reported a man, aged 54, who had had three attacks of unconsciousness and whose pulse-rate was 24. The patient had further attacks, one while drinking an infusion of camomile, and one after taking 30 drops of spiritus ammoniæ aromaticus in 2 oz. of water. Later, feeling better, the patient sat down to dinner.

"... upon taking some broth, he almost instantly felt faint, and had the same most distressing sensation as if one of his former fits were coming on. The same circumstances took place twice afterwards, on his attempting to swallow something solid. About eight in the evening, wishing again to try what would be the effect of swallowing while I was present, he took a bit of newly toasted bread. But he had no sooner smelt it, than he felt some of the sensations of a beginning fit; and as soon as he had tasted it he almost instantly cried out, and fell back senseless, with smart convulsions of all his muscles. He apparently recovered, however, in a few seconds, but hardly any pulse could be felt for a good many seconds."

He died two days later.

"... the body was opened by Mr. Fyfe, and, upon the most careful examination, no morbid appearance, of any consequence, could be discovered, either in the thorax or abdomen."

One does not know whether Mr. Fyfe would have regarded an œsophageal diverticulum as of any consequence.

Summary

A patient is described who had many attacks of cardiac syncope while eating or drinking; he had an œsophageal diverticulum.

The attacks ceased when the digitalis which he was having was stopped and he was given ephedrine.

Making him drink water and, alternatively, distending a balloon in his œsophagus caused heart-block and ventricular standstill.

Previously reported cases are mentioned.

I am grateful to Dr. A. S. Bligh for the radiological investigation; Mr. R. Marshall for the photographs; and Prof. Harold Scarborough for advice.

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Spens, T. (1793) *Med. Commentaries*, **7**, 463, quoted by Major, R. Classical Descriptions of Disease; p. 358. Springfield, Ill.
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THE AIRWAY IN TONSILLECTOMY

A TECHNIQUE FOR CHILDREN

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LAST year Doughty (1957) described a modification of the tongue-plate of the Boyle-Davis gag which allows oral intubation for tonsillectomy in children. We had been using a similar technique with standard apparatus, and we here describe how a satisfactory airway can be maintained through an orotracheal tube lying unseen beneath the tongue-plate of an ordinary Boyle-Davis gag.

Careful attention to certain details is necessary:

(i) An ordinary Magill tube fitted with a Magill's *nasal* connecting-piece is passed through the mouth and is fixed carefully in the midline by strapping immediately below the

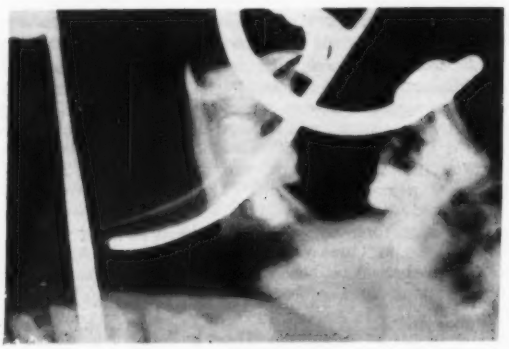

Fig. 1.

lower lip. It is then connected to the anæsthetic apparatus in the usual way.

(ii) The Boyle-Davis gag is now introduced, the tube and tongue being retained in the midline as in Doughty's method.

(iii) The gag may now be opened as wide as the surgeon requires, the tube lying unseen in the field of operation.

(iv) The distal end of the gag is supported by any available mechanical means; but it must not be raised excessively or the tube will be kinked where it emerges from under the tongue-

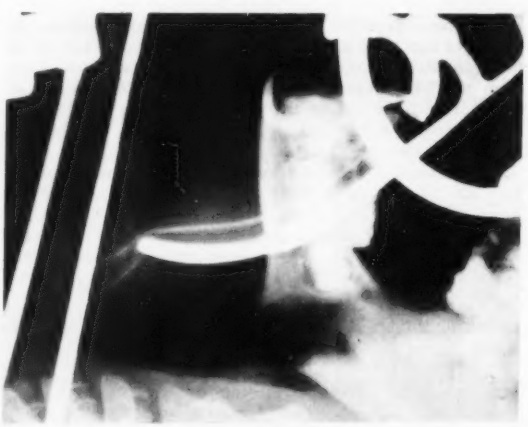

Fig. 2.

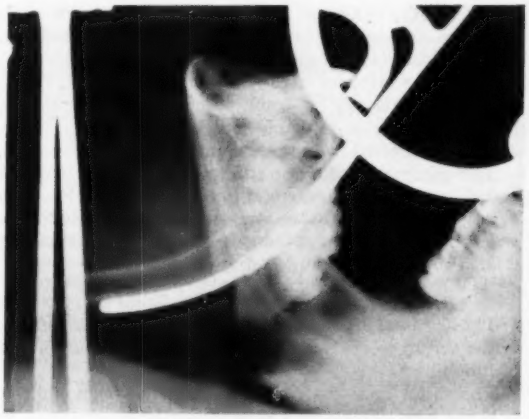

Fig. 3.

plate to enter the larynx. One great advantage of this is that the pillars of the fauces are thus relaxed, thereby aiding the surgical dissection.

Fig. 1 shows an ordinary Magill tube actually in use. Despite a faint dent in the orotracheal tube *beyond the tip* of the tongue-plate, respiratory sounds were normal and chest movements free and unobstructed. Fig. 2 shows the effect of raising the tongue-plate hook too far and the mechanism of obstruction thus deliberately caused. Obstruction does *not* occur between tongue and plate. Fig. 3 shows a McIntosh-Oxford tube in use. This has a more sturdy wall and is perhaps to be preferred for this technique, though not essential.

With colleagues, we have now used this method routinely for all children up to 14 years old without incident and with complete success. It has all the advantages of intubation, but the surgeon is unaware of the presence of a tube in his field of operation. One of us (K. R.), who has used the method both with the standard tongue-plate and with the slotted tongue-plate, has found the results equally satisfactory with either.

Our thanks are due to Dr. J. V. I. Young for suggestions; to the radiological department of Poplar Hospital, for taking the films; and to Mr. D. Kemp, of the Institute for Diseases for the Chest, for the prints.

REFERENCE

Doughty, A. (1957) *Lancet*, i, 1074.

Preliminary Communication

LIPOPROTEIN-BOUND CHOLESTEROL IN HÆMOPHILIC SERUM

POSSIBLE ætiological factors in atherosclerosis are intravascular coagulation of blood [1] and alterations in the blood lipids, particularly in the lipoprotein fractions of plasma and their bound cholesterol.[2 3] An increase in the amount of total cholesterol in the serum with an increase in the cholesterol content of the β-lipoprotein appears to be commonly associated with developed atherosclerosis; these parameters may be an indication of the state of the arterial tree. It is therefore of interest to know whether there is any deviation from the normal cholesterol-lipoprotein pattern in the serum in persons with inherited or congenital deficiencies of blood coagulation such as hæmophilia. Information on the occurrence and extent of atherosclerosis or cholesterol-lipoprotein abnormalities in such people is scanty. Stewart and Acheson [4] reported the finding at necropsy of severe atherosclerotic changes in an elderly hæmophiliac and gave values for the total and lipoprotein-bound cholesterol.

I report here the results of an investigation into the cholesterol content of the α and β lipoproteins of serum in a group of hæmophiliacs and compare them with similar observations in healthy people examined concurrently.

MATERIAL

The healthy people were men aged 19–50 (mostly 20–30).

The hæmophiliacs were all men with moderate to severe disease and aged 21–68 (see accompanying table). The clinical diagnosis was confirmed and the type (hæmophilia A or B) determined by finding a blood thromboplastic defect due to a deficiency of either antihæmophilic globulin (hæmophilia A) or Christmas factor (hæmophilia B).

1. Duguid, J. B. *Brit. med. Bull.* 1955, **11**, 36.
2. Gofman, J. W., Glazier, F., Tamplin, A., Strisower, B., De Lalla, O. *Physiol. Rev.* 1954, **34**, 589.
3. Jencks, W. P., Hyatt, M. R., Jetton, M. R., Mattingly, D. W., Durrum, E. L. *J. clin. Invest.* 1956, **35**, 980.
4. Stewart, J. W., Acheson, E. D. *Lancet*, 1957, i, 1121.

METHODS

Thromboplastin formation was measured by the method of Biggs and Douglas [5] with the additional modification of Bell and Alton.[6]

Collection of Serum.—Blood was aspirated from an antecubital vein and allowed to clot in a dry glass tube at 37°C for several hours. The serum was then separated and either analysed on the same day or stored at −25°C for periods up to several months before being analysed.

Analysis of Serum.—The lipoproteins were separated by paper electrophoresis, and the cholesterol contents of the α and β lipoprotein fractions were determined by a slight modification of the method described by Boyd.[7] Total cholesterol was taken as the sum of the α and β lipoprotein-bound cholesterol. The observed cholesterol concentrations were probably somewhat lower than the true values because it was unlikely that the cholesterol was completely extracted from the electrophoretic strip.

RESULTS

Healthy people.—In 26 men the mean total cholesterol was 173 mg. per 100 ml. (range 75–272; standard error of the mean ±9·5). The mean percentage cholesterol bound to the β-lipoprotein was 78·2 (range 66/89; standard error of the mean ±0·5).

Hæmophiliacs.—The individual data are shown in the accompanying table. The mean total cholesterol was

AGE, TYPE, SERUM-TOTAL-CHOLESTEROL, AND PERCENTAGE CHOLESTEROL IN THE β-LIPOPROTEIN IN 9 HAEMOPHILIACS

Case no.	Age (yr.)	Hæmophilia type	Total cholesterol (mg. per 100 ml.)	% cholesterol in β-lipoprotein
1	21	B	124	77
2	22	A	78	70
3	24	B	153	82
4	29	B	131	64
5	29	B	154	77
6	30	A	128	72
7	46	A	153	73
8	48	A	125	80
9	68	A	159	85

134 mg. per 100 ml. (range 78–159; standard error of the mean ±7·6). The mean percentage cholesterol bound to the β-lipoprotein was 75·6 mg. per 100 ml. (range 64–85; standard error of the mean ±2·2).

The total cholesterol values of the two groups were statistically different ($p < 0.05 > 0.01$). There was no

5. Biggs, R., Douglas, A. S. *J. clin. Path.* 1953, **6**, 23.
6. Bell, W. N., Alton, H. G. *Nature, Lond.* 1954 **174**, 880.
7. Boyd G. S. *Biochem. J.* 1954, **58**, 680.

significant difference between the values for the percentage cholesterol bound to the β-lipoprotein ($p > 0.05$).

DISCUSSION

The significantly lower mean cholesterol level in the hæmophiliacs may be a fundamental difference and related in some way to the disturbance of coagulation. However, since an early age these patients have had numerous episodes of bleeding with severe physical stresses and probably poor dietary intake during these periods. The difference may therefore merely reflect the direct and indirect effects of recurrent loss of blood with frequent periods of ill health resulting from the nature of the disease. In contrast, the percentage distribution of the cholesterol in the α and β lipoproteins showed no significant difference between the two groups. The values for both the total and the β-lipoprotein-bound cholesterol in the serum appear to be above the normal range in the atherosclerotic hæmophiliac reported by Stewart and Acheson.[4] None of the present hæmophiliacs had symptoms suggesting coronary-artery disease or vascular insufficiency elsewhere. X-ray examination of the aorta in the 3 oldest hæmophiliacs did not reveal calcification; this negative finding does not, of course, exclude the possibility of underlying atherosclerotic changes.

The data obtained in this study do not necessarily mean that the hæmophiliacs are less disposed to the development of atherosclerosis or possess less of it than do members of a healthy group comparable in age and sex. Accurate correlation can only come from direct examination of the arterial tree. Nevertheless the present information may be of some value when more pathological evidence is available and other, perhaps larger, series are reported from other sources.

The predictive value for atherosclerosis of the amount and distribution of cholesterol in the lipoprotein fractions of serum has still to be assessed. Furthermore intravascular coagulation of blood may be independently related to the development of atherosclerosis.

SUMMARY

The amounts of total and lipoprotein-bound cholesterol in the serum were determined in healthy people and in hæmophiliacs.

The mean total-cholesterol level in the hæmophiliacs (134 mg. per 100 ml.) was significantly lower than that in the healthy people (173 mg. per 100 ml.). The percentage cholesterol in the β-lipoprotein of the hæmophiliacs (75·6) was not significantly different from that of the healthy people (78·2).

I wish to thank Prof. J. S. Mitchell, F.R.S., for facilities for this work, and Miss Sheila Tomlin for technical assistance. The work was done during the tenure of an Elmore Research Studentship.

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P. BARKHAN
M.D. W'srand, PH.D. Cantab.

Medical Societies

THE HEBERDEN SOCIETY

AT a meeting of the society on Feb. 14, three papers were presented.

A New Phenylbutazone Analogue

Dr. D. M. BURLEY had compared phenylbutazone with its metabolite *p*-hydroxyphenylbutazone (designated G27202), which had been reported to have a similar antirheumatic, but more potent uricosuric, effect than phenylbutazone itself. G27202 had been substituted for phenylbutazone dose for dose (usually 200–400 mg. daily) for from five days to several weeks, in 72 patients with rheumatoid arthritis and ankylosing spondylitis. In relief of pain 9 patients found G27202 more effective, and 23 found phenylbutazone more effective; 18 patients considered them equally effective, and 22 found neither effective or the effects variable. 56 patients had no gastric intolerance to either compound, and 16 had intolerance to phenylbutazone; of these 16 patients, 8 were intolerant to G27202, but only slightly in 4. G27202 was less effective than phenylbutazone in relieving pain and stiffness in these conditions, but had about half the gastric toxicity.

Uricosuric Agents in Gout

Dr. G. D. KERSLEY, Dr. E. R. CROOK, and Dr. D. C. J. DAVEY (Bath) had investigated the effects of G28315, a phenylbutazone analogue, on the clinical condition, urinary uric-acid excretion, and serum-uric-acid levels of 15 patients with typical gout. In the 13 with normal renal function the average daily urinary excretion of uric acid rose from 551 mg. to 880 mg. on a daily dose of 400 mg. of G28315; 5 were given 800 mg. daily, and in them the daily excretion rose to 1042 mg. The average level of the serum-uric-acid fell from 7·8 to 4·0 mg. per 100 ml. (After 1–1·5 g. of probenecid daily the average serum-uric-acid levels fell from 7·8 to 5·2 mg. per 100 ml.) The response to G28315 in the 2 with impaired renal function was also very satisfactory. Intermittent administration for three days in each week did not maintain the lowered serum-uric-acid level. No toxic effects were observed on continuous administration of G28315 for periods of four to fourteen weeks, and longstanding joint swellings regressed. Acute gouty attacks increased in frequency during the first six weeks, but thereafter these became mild and infrequent; they were promptly terminated by phenylbutazone in all cases. The addition of aspirin 3·5 g. daily reversed the effects of G28315, and the urinary uric-acid excretion fell below, and the serum-uric-acid level rose above, the control levels.

Rheumatoid Polyarthritis with Negative Agglutination Test

Dr. A. ST. J. DIXON had studied all inpatients of the Rheumatism Research Centre at the Manchester Royal Infirmary who had active and progressive polyarthritis with an increased erythrocyte-sedimentation rate and negative sheep-cell agglutination test (S.C.A.T.), and in whom no diagnosis was made relevant to the polyarthritis except rheumatoid arthritis (R.A.).

Of 64 such patients 6 had died and 51 were seen again after an average of five years, when 13 had developed a positive S.C.A.T.—of whom most had a distribution of arthritis typical of R.A., and half had developed nodules. 18 had typical R.A. and a negative S.C.A.T.; none of these had subcutaneous nodules but most of them had flexor-tendon lesions in the hands. 15 had an atypical distribution of arthritis and negative S.C.A.T. without nodules or flexor-tendon lesions of any sort. 11 patients had developed confirmed or probable polyarthritic diseases other than R.A. including psoriatic arthritis, reticulohistiocytosis, myelomatosis, generalised osteoarthritis, and gout.

Dr. Dixon concluded that (1) other diseases may simulate rheumatoid arthritis very closely and a negative S.C.A.T. may alone indicate the difference; (2) there is a group of patients, requiring further study, with severe polyarthritis which does not fit the clinical and serological picture of R.A.; (3) a negative S.C.A.T. is compatible with severe or fatal disease in otherwise typical R.A.; and (4) no difference in prognosis was found in patients with typical R.A. between those whose S.C.A.T. was initially negative and later positive, and those in whom the S.C.A.T. was negative throughout. It was among the 15 cases with a negative S.C.A.T., who also had atypical R.A., that some of the severest illnesses and most dramatic remissions were found.

Reviews of Books

Modern Trends in Gastro-enterology

Editor: F. AVERY JONES, M.D., F.R.C.P., physician, Central Middlesex Hospital, and consultant in gastroenterology to St. Mark's Hospital, and to the Royal Navy. London: Butterworth. 1958. Pp. 439. 78s. 6d.

THE second series appears five years after the first, under the same able editorship. The first volume gave a remarkably wide and clear review of most aspects of gastroenterology: the second is complementary to the first, but the editor has this time aimed at picking out only certain growing points of the subject, large or small, where advances or new knowledge have been achieved. It is thus a book more for the specialist than the general practitioner, but is none the less valuable and important for that: indeed, it is exactly the type of collected information that is badly needed.

Dr. Avery Jones has gathered a team of 39 authors, most of whom are engaged in research on the subjects about which they write. Most belong to the younger school of scientists or clinicians in this country, but Dr. Jan Waldenström, of Sweden, contributes a fine article on carcinoid, and six of the authors are distinguished physicians from North America. Of new work, that on the blind-loop syndrome (Dr. John Badenoch) and on the metabolic effects of intestinal resection (Dr. W. P. U. Jackson) make fascinating reading, and so does the account by Dr. Sheila Sherlock of hepatic coma and liver-failure. Ulcerative colitis receives a full discussion which brings together much material and differing opinions on this difficult disease; but it is clear that no fundamental advance has yet been made towards solving its ætiology.

Some rarities rightly receive attention, such as the Peutz-Jeghers syndrome, but for the most part this book deals in a clear and practical way with the main aspects of modern gastroenterology, clinical, pathological, radiological, or chemical. It deserves a warm welcome and its editor and authors are to be congratulated on a splendid achievement.

Atlas of Clinical Endocrinology

H. LISSER, M.D., clinical professor emeritus of medicine and endocrinology; ROBERTO F. ESCAMILLA, M.D., clinical professor of medicine, University of California School of Medicine, San Francisco. St. Louis: C. V. Mosby. London: Henry Kimpton. 1957. Pp. 476. £7.

MANY endocrine disorders need pictures to describe them effectively: here each condition is illustrated by clinical photographs, sometimes in series, showing the evolution of the disease and the results of treatment. Radiographs, electrocardiograms, pathological specimens, graphs, or genealogical tables are often included in the same photographic plate. The quality of the reproductions is generally satisfactory but not outstanding (the colour plates of Addison's disease and Cushing's syndrome could be improved). The text, in table form, is on the whole comprehensive and accurate. Physiological and chemical aspects of the subject are deliberately omitted, which is a pity perhaps, now that clinical endocrinology has the status of an applied science.

The section on hypopituitarism suffers from too much classification into different types; and cachexia is overemphasised as a feature of the disease. It is not clear that some of the patients depicted have not in fact anorexia nervosa or functional hypothalamic disturbance. Elsewhere there are points of emphasis or omissions that might be corrected. Distinction is not clearly drawn between sporadic cretinism and childhood myxœdema, and epiphyseal dysgenesis is not mentioned, with thyroid disorders. The section on treatment of adrenal crisis does not refer to the use of intramuscular cortisone acetate as a depot or to tapering of dosage. The account of phæochromocytoma omits sweating as a cardinal symptom and erroneously describes flushing (instead of pallor) in the attacks. The discussion of the pathogenesis of congenital adrenal hyperplasia is not up to date, and the essential failure of testicular maturation is not brought out.

The sections on gonadal disorders are probably the best in the book, though the chapter on the undescended testicle does not emphasise the distinction between failure of the spermatic cords to lengthen and the migration of the testes into ectopic situations—the management of these types being fundamentally different. The book ends with a section on miscellaneous non-endocrine disorders, and a useful appendix containing growth curves and tables of height-weight-age, bone-age, and dental age.

Human Histology

A Textbook in Outline Form. LESLIE BRAINERD AREY, PH.D., SC.D., professor emeritus of anatomy, Northwestern University, Illinois. Philadelphia and London: W. B. Saunders. 1957. Pp. 337. 45s. 6d.

IN an interesting preface, Professor Arey explains to some extent the sense of disappointment and disagreement which the text will evoke in some readers. There are no illustrations, and the style is as terse as a series of memoranda, whose relative importance is marked by varying degrees of indenting: the book is, in fact, a derivative of duplicated sheets of typescript. As its author claims, "What may, perforce, be lost in smoothness and grace of style is offset by Baedeker-like concision and force and, it may be hoped, clarity". These hopes are fully realised; but it should not be overlooked that Baedeker-like books inform rather than develop comprehension. No doubt Professor Arey supplied other elements than mere information in his courses; but without an assurance of this in other places we hesitate to recommend his largely descriptive catalogue of the tissues of the body, for all its immense collection of information.

It is disappointing to find that it is still necessary to devote 337 pages to an "outline" of histology. Since each "fact" is stated, as far as possible, in a line of the text, which averages 30–40 lines in each page, about 12,000 "facts" receive mention. Can the average student absorb more than a portion of all this? And which portion?

Deliberate jettison of all that makes a textbook more than a concatenation of statements may be justified if the abbreviation is a true one, and permits more leisure for mental digestion. But if compression merely allows the introduction of further pabulum, the meal becomes indigestible. In much medical teaching today, mere instruction predominates and education lags behind. It would be harsh to judge it entirely in this light, but the book seems to us to have defects as a sole guide to beginners in histology, however useful it may prove to those who, with a background of understanding, seek to revise its facts.

Portal Hypertension

ALAN HENDERSON HUNT, D.M., M.CHIR., F.R.C.S., surgeon, St. Bartholomew's and The Royal Marsden Hospital. Edinburgh and London: E. & S. Livingstone. 1958. Pp. 230. 40s.

IN British surgical literature Jacksonian prize essays form an ancient lineage. Mr. Hunt's monograph on portal hypertension, which was awarded this prize by the Royal College of Surgeons of England in 1956, now appears in print; and it proves him worthy of his illustrious predecessors. The book is essentially a clinical account, based on 250 cases, the largest individual series yet analysed in this country. It does more, however, than describe methods and present results: it reflects the struggles, failures, and successes which have made the first ten years of operative treatment of portal hypertension one of the most exciting chapters in surgery. Its smallness was dictated by the requirements of the prize for which it was submitted, and the author regrets that 75,000 words did not allow him to summarise all recent scientific work on liver disease and hepatic circulation; but he has been outstandingly successful in relating that work to his own clinical experience.

His concise yet uncramped style, as well as the soundness of his judgment, will assure for the book a warm welcome not only from specialists but also from general physicians and surgeons, many of whom still regard the surgical treatment of portal hypertension with a mixture of awe and distrust. If, after reading these pages, they decide that it is still a highly

specialised subject, they will yet have enjoyed and profited by a lucid account of a complex but not uncommon group of illnesses.

In common with most workers in America and in this country, Mr. Hunt favours shunt operations as the surgical treatment; but he never turns a blind eye to their limitations and dangers. Apart from many technical difficulties, patients with severe and even moderately advanced cirrhosis are still beyond surgical help: and the emergency treatment of ruptured varices remains controversial and, on the whole, unsatisfactory. (George Crile contributes a useful chapter on transœsophageal ligation of varices.) Mr. Hunt deals with technical matters and alternative operations in a series of appendices from which no detail of practical importance has been omitted; and a series of succinct case-histories complete the work. The illustrations are a credit to the writer's technical and clinical team and to his publishers.

New Developments in Analytical Psychology (London: Routledge & Kegan Paul. 1957. Pp. 214. 25*s*.).—This book by Dr. Michael Fordham contains nine essays on various topics of analytical psychology. The first four, which are the longest, are concerned with biological theory and the concept of archetypes; the archetypes and synchronicity; image and symbol; and the transference. As in most Jungian writings, a difficult subject is not simplified for the uninitiated by conciseness or by definition of the ideas considered, but most psychotherapists should glean occasional kernels. The last five chapters are concerned with theories of child development, the analysis of the child, and the child-guidance approach to marriage, and are less theoretical in presentation.

Hospital Coccal Infections (Association of Clinical Pathologists. 1958. Pp. 39. 3*s*. 6*d*.).—Last year a symposium on hospital coccal infections was organised by the Association of Clinical Pathologists and the Medical Research Council Committee on Cross-infection in Hospital, and we gave some account of it.[1] The papers by the principal speakers have now been published, together with summaries of the discussions, in a booklet, which may be obtained from the Swan Press, Ltd., 20, Bakers Row, Farringdon Road, London, E.C.1. The editors are Dr. R. E. O. Williams and Dr. R. A. Shooter.

1. See *Lancet*, 1957, i, 92.

New Inventions

THE ST. THOMAS'S HOSPITAL NERVE STIMULATOR
IN THE DIAGNOSIS OF PROLONGED APNŒA

UNEXPECTEDLY prolonged response to muscle relaxants has been reported increasingly often in recent years [1–4]; and its possible theoretical causes have been outlined.[5] One of the principal difficulties facing most anæsthetists is to determine whether the failure of return of full muscle power is due to a central cause affecting the brain (e.g., analgesic, anæsthetic, or excess of carbon dioxide), or to peripheral weakness caused by prolongation of the neuromuscular block. No ordinary clinical examination can differentiate between these two causes; but electrical stimulation of a peripheral nerve (e.g., ulnar) will immediately reveal whether the skeletal musculature is responding to impulses or not, provided the intensity of the stimulus (i.e., the current) is sufficient.

1. Hunter, A. R. *Brit. med. J.* 1956, ii, 919.
2. Foster, P. A. *Brit. J. Anæsth.* 1956, **28**, 488.
3. Bourne, J. G., Shackleton, P. *Brit. med. J.* 1956, ii, 1485.
4. Burchell, G. B. *Brit. J. Anæsth.* 1957, **29**, 127.
5. Churchill-Davidson, H. C. *Anesthesiology*, 1956, **17**, 88; *Brit. med. Bull.* 1958, **14**, 31.

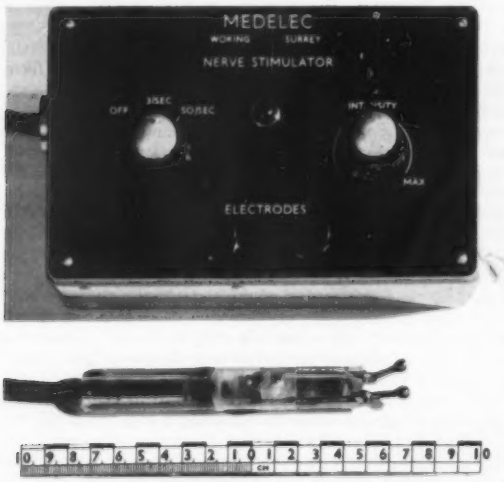

Fig. 1.

Fig. 2.

In the past, electrical stimulators have not been readily available, but during the last five years various models have been in use at this hospital for research purposes. The present apparatus (fig. 1) has been designed for use in the operating-theatre and is now produced commercially. It is capable of stimulating at either slow rates (twitch—3 per sec.) or fast rates (tetanus—50 per sec.). In man, ordinary volition uses a rate varying from 30 to 50 per sec. according to the force of the muscle contraction. The intensity of the stimulus can be altered at will, but in the unconscious subject it is advisable to use the maximum possible to ensure that all the muscle-fibres served by that nerve will contract.

In the event of an abnormal response to a muscle relaxant this machine can be used to stimulate the ulnar nerve at the wrist or the elbow (fig. 2). Then, if neuromuscular block is present, the 4th and 5th fingers will not move; on the other hand, if normal neuromuscular transmission is present, the typical picture of main-en-griffe will result.

We believe this nerve-stimulator will prove very useful to anæsthetists. It can be used to study the action of muscle relaxants during routine anæsthesia or (by changing the electrodes) to detect the whereabouts of the facial nerve at operation.

Our thanks are due to Dr. P. Bauwens for his helpful advice.

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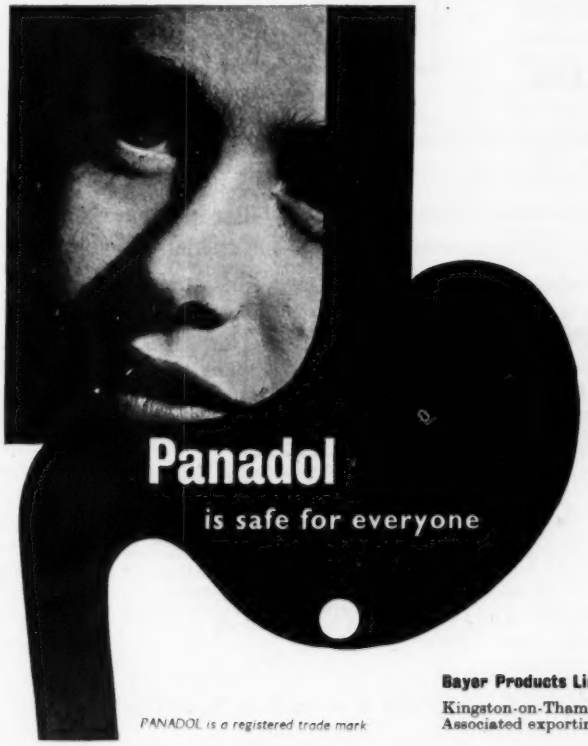

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THE LANCET
LONDON 12 APRIL 1958

Iodine Prophylaxis of Goitre

"ENDEMIC goitre is the easiest known disease to prevent," said MARINE [1] in 1915. This confident remark has been fully justified by subsequent experience. The United States, Switzerland, and New Zealand have been using prophylactic iodine for several decades, and goitre has notably declined in all three countries.[2] Similar measures have been introduced more recently in Canada, Mexico, Guatemala, Colombia, Peru, Argentina, Paraguay, Sweden, Holland, Poland, Rumania, Yugoslavia, Hungary, Czechoslovakia, Italy, and parts of Australia.[2] These measures have been applied with varying degrees of thoroughness, and in most cases too recently for proper assessment of the results. Nevertheless it is impressive that so many countries should think it worth taking official action to increase the iodine intake of their inhabitants. So far this country has made no attempt to eliminate goitre. The iodisation of salt was recommended by a subcommittee of the Medical Research Council in 1944 [3]; and this recommendation was widely supported.[4] In 1950 the Government of the day seemed about to take action,[5] but in the event nothing was done. So many other countries are now ahead of us in this simple public-health measure that official inertia is making us look somewhat oldfashioned.

We do not know what induced the Government to withdraw its proposed measures for iodising salt, but there seem to be at least three rational grounds for hesitation.

One is the possibility that in this country other goitrogenic factors outweigh the effects of iodine deficiency. In clinical practice occasional goitres are certainly not due to iodine deficiency—for example, those due to chronic thyroiditis, the goitrogenic drugs, and hereditary causes. All these are rare, however, and they are distinguished from ordinary sporadic goitre by their tendency to be associated with hypothyroidism. Our diet is unlikely to include significant amounts of goitrogenic substances unless we consistently eat raw turnips [6] or drink milk from cows fed on related cruciferous plants [7]; and if such substances were an important constituent of the diet we should expect to encounter hypothyroidism as well as goitre. ASTWOOD [6] has pointed out that the thyroid is likely to compensate better for iodine deficiency than for a chemically induced block in thyroxine synthesis. The fact that the ordinary goitre is practically never associated with hypothyroidism is indirect evidence that it is caused by iodine deficiency rather than by a positive goitrogen. More direct evidence has been provided by BURRELL and FRASER,[8] who have shown that some non-toxic goitres studied in London were unduly avid for radioiodine but that this avidity could be abolished by brief treatment with small doses of iodide. While there is no proof that iodine deficiency is the main factor in the causation of goitre in this country, there is at least no evidence incompatible with that hypothesis.

A second possible reason for official hesitation is the argument that goitre in this country is not of sufficient practical importance to warrant action on a national scale. In most cases, it may be reasoned, the inconvenience of having a goitre is cosmetic rather than medical. Admittedly it has never been proved that the common accompaniments of endemic goitre—cretinism and deaf-mutism—are themselves caused by iodine deficiency, and it is still open to question whether a reduction in the incidence of simple goitre would be associated with a similar diminution in the incidence of toxic goitre and thyroid cancer. Yet even in the absence of these complications there are disadvantages about having nodules in one's thyroid. In his article at the beginning of this week's issue Mr. SELWYN TAYLOR traces the origin of thyroid nodules back to a stage of simple hyperplasia; and it is at this stage (probably about the age of puberty) that we believe goitre to be preventable. Once puberty goitre has developed, thyroxine or thyroid extract is a rational, and often an effective, treatment. But when nodules are present the surgeon's knife is the only useful therapeutic weapon. This is an expensive weapon, involving the cost of perhaps two weeks' stay in hospital as well as that of the operation. We have no way of estimating how often this operation is being performed; but the Registrar-General's review of hospital inpatients for 1951 shows that patients with non-toxic goitre comprised nearly 1% of the female non-obstetric admissions to teaching hospitals. If most of these admissions could be avoided the reduction in hospital costs, though not spectacular, should at least offset the cost of iodising salt. On balance iodine prophylaxis could be expected to pay for itself, and even yield a modest profit to the community.

The third, and perhaps most cogent, reason for doubt about the desirability of iodine prophylaxis is disinclination to compel people to eat what experts think is good for them. This attitude is by no means wholly irrational, since the conclusions of Science are never final but are merely the best current approximations to truth. During the war the fortification of margarine and other foodstuffs with vitamin D appeared, in the light of contemporary knowledge, to be wholly beneficent; but we now know that the addition of this vitamin can easily be overdone and may be a factor in the causation of infantile hypercalcæmia.[9] At present the addition of small quantities of iodine to salt seems to be entirely unobjectionable and unlikely to do anyone the slightest harm; but no-one can unreservedly guarantee that this will turn out to be true. A deeper, if less rational,

1. See Kimball, O. P. *Bull. World Hlth Org.* 1953, **9**, 241.
2. Kelly, F. C., Snedden, W. W. *ibid.* 1958, **18**, 5.
3. Goitre Subcommittee, Medical Research Council. *Lancet*, 1944, i. 107.
4. *Lancet*, 1944, i, 121; *ibid.* 1955, ii, 125. Report of the Committee on Nutrition, British Medical Association; London, 1950. *Brit. med. J.* 1950, i, 654. *Times*, March 23, 1950.
5. *Lancet*, 1950, i, 632.
6. Astwood, E. B. *Ann. intern. Med.* 1949, **30**, 1087.
7. Clements, F. W., Wishart, J. W. *Metabolism*, 1956, **5**, 623.
8. Burrell, C. D., Fraser, R. *Quart. J. Med.* 1957, **26**, 559.
9. See *Lancet*, 1956, i, 1052.

objection along the same lines is that further encroachment on the liberty of individuals should be resisted. The nature of our complex civilisation demands that we submit to many restrictions on our freedom of action as individuals; but our aim should be to keep these restrictions to the bare minimum necessary for the smooth running of society. Hence it seems desirable that, although iodine prophylaxis should be introduced as soon and on as wide a scale as possible, some loophole should be left by which those who wish can avoid receiving iodine. From this point of view an excellent vehicle for the distribution of iodine would be salt, as was recommended by the M.R.C. subcommittee; and much technical information has been accumulated about methods of iodising this material.[10] What is required is that some 95% of all salt used domestically shall be iodised at the level recommended by the M.R.C. Anyone ordering salt would automatically be given iodised salt unless he specifically asked for non-iodised. In this way the majority could be protected against goitre without encroaching on personal liberty. TAYLOR reaches a similar conclusion. The time has surely come for further thought by the Government.

Bleeding Varices

THE treatment of ruptured œsophageal varices may have to be undertaken by comparatively inexperienced surgeons at short notice and under difficult circumstances. The coming of blood-banks inspired the first attempts to deal actively with this emergency. The dramatic effect of prompt massive transfusion on most forms of acute hæmorrhage encouraged the hope that this would prove the life-saving first-aid treatment of bleeding cirrhotics. Such hope was soon dispelled: experience showed that transfusion alone did not reduce mortality, and that in at least three different ways it could be a contributory cause of death. It first became apparent that dilution of the circulating clotting factors by transfused blood made cirrhotic patients, with their already depleted stores, the least suitable subjects on whom to test an excessive faith in banked blood. It was then recognised that hepatic failure, precipitated by large nitrogenous blood-meals, was as potent a cause of death as circulatory collapse from blood-loss itself; and that the greater the amount of blood given, the greater the amount the patient could shed into his gastrointestinal tract. Most recently attention has turned to citric-acid intoxication [11]—a real danger when liver function is impaired. Blood-transfusion remains an invaluable supportive measure; but complete reliance cannot be placed on it.

If the phase of massive transfusions was one of unfulfilled hope, BLAKEMORE hardly exaggerates when he describes the next phase as the "carnage of cirrhotics".[12] It coincided with a tremendous advance in the management of bleeding peptic ulcers—the wider recognition that seemingly moribund patients could be restored to health by judiciously timed operations and by expert perioperative management. But the knife, which brought new hope to many ulcer patients, spelt doom to the majority of bleeding cirrhotics: they too were operated on for bleeding ulcers; and they died of hepatic failure. This era left the bleeding-ulcer majority deeply indebted to the hapless minority of bleeding cirrhotics; it ended not with dramatic advances in surgical technique but with the growing realisation that cirrhotics can ill withstand even the best of surgery. In at least 70% of hæmatemeses a bleeding ulcer can be diagnosed with fair certainty; but if bleeding cirrhotics are to be given a fair deal, the remaining 30% should be treated (until a diagnosis is clearly established) as potential cases of ruptured varices. This demands an entirely different therapeutic approach. In the potential cirrhotic the primary aim is not to replace but to stop the blood-loss; and laparotomy is not a valid diagnostic procedure.

Differential balloon-tamponade, which serves the dual purpose of diagnosis and treatment,[12-14] has been a real advance in the management of these cases.

It is carried out with a specially designed three-lumened tube, equipped with a sausage-shaped œsophageal balloon and a spherical gastric balloon. After accurate positioning of the œsophageal balloon by preliminary gastric inflation, air is slowly introduced into the naso-œsophageal tube. The distending balloon in the œsophagus encompasses the varices above the cardia; and when the pressure inside it (measured by a built-in mercury manometer) rises above the patient's portal pressure, bleeding ceases. BLAKEMORE [12] rightly insists that the balloon used should be specially designed and tested for this purpose.

If inflation of the œsophageal balloon does not arrest the bleeding—and this can be verified by aspirating through the nasogastric tube—the gastric balloon must be inflated. As much as 400 c.cm. of air may have to be introduced into this stouter bag; and an upward pull of 2 lb. is usually needed to compress effectively the stomach against the diaphragm.

If such traction-tamponade does not control the bleeding, it is reasonable to assume that the bleeding-point lies distal to the proximal half of the stomach—probably in an ulcer crater—and some surgeons would attempt to localise it by injecting small amounts of barium into the feeding tube. If the bleeding is arrested, a ruptured varix in the upper stomach is the likeliest diagnosis. Unfortunately such a finding commits the surgeon to almost immediate operation. Not only is compression of the proximal stomach for more than a few hours intolerable to the patient: it also leads to rapid deterioration of the gastric mucosa, and, often within twenty-four hours, to ulceration and gangrene. It is true that only about 10% of ruptured varices are on the gastric side of the cardia. It is also true that the outlook for these patients is poor from the start, and that many have to be operated on as a last desperate measure. Traction-tamponade itself, however, makes laparotomy imperative; whereas conservative measures alone—skilled sedation, carefully regulated drip-transfusion, and prophylaxis of liver failure—occasionally tide patients over the acute episode and allow the surgeon to intervene at a more opportune moment.

10. Holman, J. C. M. *Bull. World Hlth Org.* 1958, **18**, 255.
11. See *Lancet*, 1957, ii, 1152.
12. Blakemore, A. H. *in* Current Surgical Management (edited by J. H. Mulholland, E. H. Ellison, and S. E. Friesen). Philadelphia, 1957.
13. Sengstaken, R. W., Blakemore, A. H. *Ann. Surg.* 1950, **131**, 781.
14. Boerema, I. *Congr. int. Gastroent.* Paris, 1954. See also *Lancet*, March 29, 1958, p. 681.

In contrast to traction-tamponade of the stomach, œsophageal tamponade can be maintained for three or four days if necessary. Continued distension of the lower gullet is very unpleasant, but it is rarely intolerable; and nasal ulceration and necrosis can usually be prevented by nursing care and antibiotics. There is rarely justification for rushing unprepared into operation on the ground that œsophageal tamponade can be maintained no longer. Unfortunately, often what is loosely described (and justly decried) as "œsophageal" tamponade is, in fact, half-hearted traction-tamponade on the stomach. It is easy to control bleeding from a ruptured œsophageal varix by compressing its feeding vessel in the upper stomach—and when some improvised contraption is used this is what usually happens—but such a manœuvre is both unnecessary and unpleasant. When the varices are in the œsophagus, œsophageal balloon-tamponade properly performed will always provide at least a breathing-space for improving the patient's general condition and summoning expert surgical help.

LINTON and ELLIS,[15] have found that it is best to prepare patients for operation as soon as the hæmorrhage is controlled. These workers reported 20 cases in which they had performed transthoracic transœsophageal ligation of the bleeding varices either with a view to later shunt operation or as a definitive measure. 2 patients died as a direct outcome of the operation, and 3 succumbed to liver failure or recurrent bleeding before a shunt procedure could be done; but in the remaining 15 it was possible to construct, after varying intervals, a portocaval or a lienorenal shunt. Transœsophageal ligation of the bleeding varices has the supreme merits of comparative safety and simplicity[16-18]; but usually it is of no more than temporary benefit. CRILE[19] has achieved some good long-term results in patients with extrahepatic blocks[19]; but LINTON[20] found that in more than a third of cirrhotics the bleeding recurred in a few weeks or months. In this country TANNER[21] devised an operation in which the mid-stomach was transected and resutured after division of all the vasa brevia and of all the branches of the left gastric vein which drained the proximal half. Unfortunately, several patients had recurrent bleeds; and, though postmortem injection studies showed no appreciable flow across the gastric suture-line, anastomotic branches between the œsophageal and phrenic veins had apparently maintained a dangerously high pressure in the varices. This led TANNER to devise a subcardiac porto-azygos disconnection.[22] By an abdominothoracic approach he frees the lowest five centimetres of the œsophagus and the uppermost five centimetres of the lesser and greater curves of the stomach from all external vascular connections; the stomach is then completely transected and resutured five centimetres below the cardia, leaving just enough blood-supply from the œsophagus to nourish the small upper gastric segment. TANNER[23] reported that in each of 11 cases of acutely bleeding œsophageal varices this operation arrested the bleeding; but some months later 2 patients bled again, and a further patient succumbed to hæmorrhage from gastric ulceration at the suture-line. He also performed the operation in many cases as an interval procedure, with excellent long-term effects. This is very encouraging; but post-vagotomy stasis is an almost inevitable sequel to the operation, and, though a few days' gastric suction are an adequate countermeasure in most cases, a second-stage pyloroplasty had to be performed in 2 of TANNER's patients. HUNT[18] points out that the operation can be extremely difficult, and he suggests that it is less likely to succeed in cases of cirrhosis than in cases of extrahepatic obstruction.

Of the other possible operations, more or less extensive gastric and gastroœsophageal resections, pioneered in America by PHEMISTER and HUMPHRIES,[24] may gain a place in the emergency as well as in the interval treatment of ruptured varices.[25 26] Hepatic-artery ligation,[27] though it cannot be recommended in its present form,[28] may yet emerge from obscurity disguised as "portalisation of the artery".[29] Splenectomy still has a few indications[18] and a few able if cautious advocates.[30] Shunt procedures,[31-38] now widely regarded as the surgical treatment of choice, have already been performed for acute hæmorrhage. O'SULLIVAN and PAYNE[39] reported 9 cases submitted to this operation as emergencies: 3 died in the immediate postoperative phase, and 3 died later from liver failure; but none of the 6 who survived operation bled again. "Arterialisation" of the liver may further widen the scope of shunt operations.[18 40-43] The threat of hepatic failure is at present the most stringent limiting factor in the selection of patients for operation; and, even though few patients with advanced cirrhosis are selected, it remains by far the commonest cause of postoperative death. "Hepatic arterialisation" aims at preventing this complication. Theoretically it can be achieved by connecting the hepatic end of the divided portal vein to the proximal end of a divided and dispensable artery of the region. But no such procedure has yet graduated from the experimental class—and even at that level results are not wholly encouraging.[44] Nevertheless further progress may be along these lines.

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Pituitary Tumours

Of the many pituitary tumours most are adenomas, and some are Rathke pouch tumours—otherwise called craniopharyngiomas, indicating their origin in fragments of the embryonic evagination of the roof of the mouth which becomes the adenohypophysis. Primary malignant lesions are rare. The adenomas usually present in adult life; radiographs show much ballooning of the sella turcica and erosion of the clinoid processes. The Rathke pouch tumours often give symptoms in childhood; they are extrasellar more often than intrasellar, with a typical radiographic picture of calcification above a much less expanded pituitary fossa. Any pituitary tumour may threaten life and vision by pressing on nervous tissue or by causing internal hydrocephalus. Symptoms include headache, nausea, vomiting, blurred vision (sometimes transient or uniocular), and bitemporal or other scotomas; less common are epilepsy, trigeminal pain (not always due to malignant lesions), hemiparesis, diplopia, ophthalmoplegia, and papillœdema. Involvement of the hypothalamus may give rise to obesity, thirst, polyuria, thermal disturbances, and somnolence.

Such dramatic and urgent events may obscure the fact that pituitary tumours usually have an endocrine as well as a neurological aspect, and that the endocrine effects often long precede the neurological. Jefferson [1] studied 131 cases of chromophobe adenoma and 57 cases of Rathke pouch tumour. In half the male patients with chromophobe adenoma there was a history of sparseness of facial hair, sometimes with definite lack of body hair, usually starting in the late 'teens or early twenties, and preceding visual symptoms by as much as 45 years. The first symptom in half the female patients was upset in the menstrual rhythm, followed after a shorter interval ($5^1/_2$ years on average) by visual symptoms. It has long been accepted that chromophobe adenomas (in contrast to the hypersecreting eosinophilic adenomas, which give increased somatic growth, and the very rare basophilic adenomas) do not contain active hormones but tend to cause hypopituitarism by crowding out the other cellular elements of the hypophysis. But might not the chromophobe adenoma be regarded as a group of cells which multiply in an effort to compensate for some metabolic abnormality? [1] Russfield and her colleagues [2] think so. They believe that the primary defect may be atrophy and insufficiency of the gonads or thyroid; that this eventually stimulates the pituitary to hyperplasia and neoplasia; that some "chromophobe adenomas" do secrete hormones which can cause hyperplasia of the adrenal glands and other "target organs"; indeed that the difference between the tumours of acromegalic and non-acromegalic patients is often quantitative rather than qualitative. Be that as it may, it is beyond question that the various types of pituitary tumour can destroy the pituitary, and so lead to atrophy of the adrenals, thyroid, gonads, and genital tract, and to the clinical syndrome of severe hypopituitarism.[3] It seems likely, too, that pituitary insufficiency from pituitary tumours is incomplete more often than complete, and the incomplete form can be a more elusive diagnostic problem. At the Mayo Clinic Troen and Rynearson [4] found evidence of 41 mild and 25 severe cases of hypopituitarism in 153 patients before operation. Endocrine insufficiency is an important source of ill health in such cases and demands treatment with, say, cortisone, testosterone, or thyroid, or combinations of these, according to the needs disclosed by clinical and laboratory assessment. Conversely, the finding of an endocrine disorder may demand a radiograph of the skull, since there may be no other clinical pointer to a pituitary tumour.

Patients with untreated hypopituitarism are liable to attacks of mental confusion or coma, often associated with bizarre neurological signs. The attacks may be precipitated by intracranial operations, hæmorrhage into a pituitary tumour, infections, drugs, or anæsthesia; and be associated with hypoglycæmia, or sodium depletion, or water retention, or cerebral anoxia.[5] Severe endocrine failure, especially of the adrenal cortex, seems to be the most important common factor in these catastrophes; and in the presence of a big pituitary tumour there is real danger that such attacks be wrongly attributed to, say, internal hydrocephalus or pressure on vital cerebral structures; and so lives may be lost for want of cortisone therapy. Jefferson,[6] in a retrospective study covering periods before the introduction of modern endocrine treatment, considered that of 61 deaths in cases of pituitary tumour 26 were due wholly or partly to endocrine failure. After operations on the pituitary, complications are commoner in patients with hypopituitarism, and their incidence is reduced in these patients by giving cortisone before operation.[4] Although many postoperative complications and deaths are not readily explained by endocrine disorder [4 5] cortisone reduces the general mortality from operations on pituitary tumours, irrespective of the preoperative and postoperative endocrine status.[4]

In the treatment of the tumour mass, operation is rarely required in the absence of visual disturbance; but it is imperative if there are urgent pressure symptoms. With Rathke pouch tumours, deep X-ray therapy is unsatisfactory and operation risky. There is less certainty about the management of pituitary adenomas with mild to moderate visual loss. At the Lahey Clinic [7] in 1932–49, 89 patients were treated for visual loss by irradiation only, but of this number 56 were operated on subsequently because vision was not held at a useful level; indeed, the vision of some was so greatly reduced that they were not benefited by surgical removal of their adenomas. Since 1950 a method has been used whereby a tumour dose of 4000r can be delivered with safety. Of 66 patients with visual loss so treated in

1. Jefferson, A. A. *Ann. R. Coll. Surg. Engl.* 1957, **21**, 358.
2. Russfield, A. B., Reiner, L., Klaus, H. *Amer. J. Path.* 1956, **32**, 1055.
3. Sheehan, H. L., Summers, V. K. *Quart. J. Med.* 1949, **18**, 319.
4. Troen, P., Rynearson, E. H. *J. clin. Endocrin.* 1956, **16**, 747.
5. Caughey, J. E., Garrod, O. *Brit. med. J.* 1954, ii, 554.
6. Jefferson, A. A. *J. Neurol. Neurosurg. Psychiat.* 1957, **20**, 265.
7. Horrax, G. *Arch. Neurol. Psychiat.* 1958, **79**, 1.

1950–55, only 8 have required operation. These preliminary results are encouraging; but during therapy there is need for the most careful evaluation of visual tests, for which the neurosurgeon should be responsible.[8] Patients with pituitary adenomas who are correctly treated can survive a long time.[1] These cases are well worth the thoughtful care which must be given to their diagnosis and management.

Annotations

THE EVOLUTION OF VISION

WHEN Lister returned from Scotland, surgical London flocked to his first lecture to hear the latest news of his technique; but he had been interested in the curdling of milk, and told the audience, instead, about the *Bacillus lactis* that he had discovered. Introducing his Lister oration on March 28 with this story, Sir Stewart Duke-Elder elected to talk, not of any detail of eye surgery, but of the Emergence of Vision in the Animal World. He pointed out that whereas most lower animals depend largely on other senses, and their brains (" nose-brains ") are largely devoted to smell, the human brain is an " eye-brain ", with its receptive area behind, large association areas, and centres for control and coordination further forward.

Sensitivity to light is first manifest as a motor reaction. An amœba will move away from light as it will from any other noxious stimulus; some insects move not directly towards or away from a light but in a direction at a constant angle to it. By this means an ant, moving at a constant angle to the sun's rays, can find its way back to its home; but if it is imprisoned in the dark while the sun moves through an arc, when released it will set off in the wrong direction. Moreover, if the source of light is, unlike the sun, near by, moving at a constant angle will involve moving in a spiral; that is why the moth flies to its death in a candle flame. Bees can orient themselves by the sun, but can make a correction for the time of day, and so can birds. Manx shearwater released in America flew, lost, in any direction on an overcast day; on a sunny day they oriented themselves correctly in 40 seconds, and flew across the Atlantic, each to its own particular burrow off the west coast of England.

These reactions are unlikely to involve visual *perceptions*. Plants too can react to light—*Hedysarum girans* nods to a passing cloud—and machines can follow a torch. In animals purposeful appreciation can reverse the automatism of a response: thus a cockroach, which normally avoids light, can be taught to approach it if there is a dark shelter underneath. The first animal to show such intelligent appreciation is the earthworm, which has many light-sensitive cells, and normally approaches a dim light and avoids a bright one; but it can be conditioned to respond in other ways. Thus vision for the first time is associated with awareness: the animal can see, though it cannot form an image of anything. Appreciation of movement in the outside world is evident in the molluscs: any movement causes the protrusion of the organs of chemical and tactile sense. But sensitivity to movement is important in an animal as high as the rabbit, which will run into a stationary man. Form vision appears in cephalopods—an octopus can distinguish between vertical and horizontal lines—and colour vision in certain insects, though it is important only in fishes, birds, and primates.

Development of vision depends on environment. In deep-sea fishes, which live in darkness, it is lost; in small mammals, such as the dog and cat, living near the ground, it is less important than tactile and olfactory sensation. The highest development has come in certain fishes (living in a three-dimensional world) and more particularly in birds and arboreal creatures—tree-snakes, tree-shrews, and primates. The swaying habitat of branches necessitated the development of prehensile limbs and fine stereoscopic vision; moreover, "the security of the tree-tops allowed an escape from the urgent fears of life on the ground with its teeming population of predators, so that the senses, not constantly alert for danger, turned to other things ". New explorations by hand and eye gave rise to new associations, curiosity, and inventiveness—the foundation for the intellectual supremacy of man.

A chimpanzee, unlike lower mammals, will amuse himself visually—by looking at the world upside down or through a hole, or even with a kaleidoscope. This is the first indication, says Sir Stewart, " that vision has become elevated from the level of biological usefulness to approach that of æstheticism ". In evolution, he says, there are stages when something new appears different from its constituent parts; thus the molecule differs from its atoms, and other stages are marked by the emergence of life and of consciousness. In the evolution of vision the first stage is that of the motor reaction, the second that of perceptual vision, which emerges in the earthworm with a brain-ganglion, for it needs central nervous organisation. The third emergent is imaginative vision, exploratory and creative, dependent on the development of forebrain and association areas.

We know that animals see, but not what they see. Analysis of our own perceptions is hard; analysis of those of dumb creatures is impossible. Sensations can be appreciated and interpreted only through our perceptions; we know of no corresponding higher stage for the interpretation of our perceptions. But the brain of a bee, which can correct for changes in the sun's position with time, is only $^1/_{10}$ in. across; the brain of man is vastly bigger, and may expand further. New capacities and understandings may well emerge—given time, for the apes threw sticks and stones, and we throw atom bombs.

NOMENCLATURE OF PATHOGENIC FUNGI

THE former unsatisfactory state of the nomenclature of fungi pathogenic to man was due, in some measure, to inadequate description of newly named species, which led to the same species being renamed from time to time by different authors; also to the tendency to variation inherent in many fungi, the unidentified variant often being accorded specific rank. These faults gave rise to multiplication of names, and in a work on pathogenic fungi published twenty years ago some 746 " species " were recorded. Since then a new and more scientific interest in fungus diseases, particularly the systemic infections, has been aroused by the discovery of their widespread distribution in some countries, mainly through mass radiography of the chest and routine testing for specific cutaneous sensitivity to fungus antigens.

Through the work of the Committee on Medical and Veterinary Mycopathology of the International Association of Microbiologists, international agreement on the

8. Ray, B. S. *ibid.* p. 5.

use of recommended names has been secured to a great extent, and revised nomenclature is in general use in the countries of North and South America and the British Commonwealth, and to a lesser degree in some European countries. To ensure uniformity and avoid confusion, authors of papers on fungus diseases and medical mycology should consult the revised authoritative list of names of pathogenic fungi and fungus diseases.[1]

THE UNHEALTHY AREAS

EVER since Farr, the General Register Office has been disturbed by the striking disparities in death-rates between different areas in England and Wales. Such disparities are important for two reasons: first, as a spur to local public-health action, and secondly as suggestive clues in epidemiological studies of disease causation. In this respect, the analysis of mortality by geography supplements its dissection by occupation; and by the publication of the volume on area mortality,[2] the Registrar General completes the major studies based on the national experience during the years around the 1951 Census.

The geographical distribution of mortality in England and Wales follows a set pattern with higher death-rates in the north and west. In the north-west region both male and female mortality-rates were at least 10% above the national average; and an excessive infant mortality there completes the evidence of an adverse social environment. As the Registrar General remarks, climate in itself is unlikely to be of major importance. Indeed a detailed survey of the death-rates by cause in different areas strongly suggests the relevance of atmospheric pollution. Bronchitis, for example, bears much more heavily on both sides in the north-western region; and there is a marked gradient in mortality from the standardised mortality ratios for both sexes. Male mortality, for example, rises from 62% of the national average in the rural districts to 139% in the provincial conurbations. Greater London, with a rate of 123 for male and 117 for females, is still seriously afflicted, particularly in districts such as Shoreditch and Southwark where the smoke pall lies heavy.

Some of the social and selective factors which determine the incidence of disease and death are apparent in the experience of the county boroughs largely devoted to major industries where either men or men and women may be employed. In cotton towns such as Oldham, the death-rate among women is 23% above the national average. Some of this excess can be explained by death-rates from bronchitis more than twice the rate for women in the country as a whole; and it is possible that the effects of employment outside the home are superimposed on the results of a smoky and crowded domestic environment. It is perhaps significant that in towns such as Oldham and Rochdale the infant-mortality rate is among the highest in the country.

The men of the mining areas of South Wales have the high mortality from respiratory diseases usually associated with this occupation, but the women of the same areas shared this excess of mortality. In Merthyr Tydfil, for example, the death-rate among females was 23% above the national average. These findings emphasise how death-rates by occupation must be looked at against the perspective of the mortality patterns of the areas where major industry is sited. The interpretation of death-rates whether by occupation or area also depends on the community history of the ebb and flow of migration in step with the expansion and contraction of the basic industry on which depends the inhabitants' standard of life. The draining of the fittest and most vigorous men away from derelict areas, agricultural or industrial, has always been a melancholy spectacle; and its end-results are evident in the vital statistics of the residual population. Whether because of similar migration of the fit single women, or through some process of assortive mating by emigrant males, similar trends are evident in the mortality of the women in these areas.

Any realistic assessment of this latest publication by the General Register Office will thus require the most careful partitioning of blame for excessive mortality between occupational, environmental, and socio-economic factors. There is, however, in these tables of assembled facts no reason for complacency about the health of many of our most important areas and much to stimulate thought, research, and action.

1. Nomenclature of Fungi Pathogenic to Man and Animals: names recommended for use in Great Britain. Medical Research Council memorandum no. 23 (revised edition, 1958). H.M. Stationery Office. Pp. 15. 1s. 3d.
2. The Registrar General's Decennial Supplement, England and Wales 1951. Area Mortality. London: H.M. Stationery Office. Pp. 82. £3 10s.

CLOSTRIDIUM WELCHII FOOD-POISONING FROM COLD CHICKEN

COLD chicken is a traditional item in the diet of the convalescent, and indeed of any patient whose digestion is considered unequal to the rigours of ordinary diet. For its preparation a big hospital may have to boil some twenty or more fowls at a time. These are usually cooked in a large boiler in water for some two to three hours, after which they are removed from the boiler and allowed to cool at room temperature before being refrigerated. This process is not without risks of bacterial contamination, which may lead to food-poisoning. In the United States McClung [1] reported outbreaks, among the customers of a large public cafeteria, of *Clostridium welchii* food-poisoning conveyed by chicken cooked one day and served the next. On page 787 of this issue, Dr. McNicol and Miss McKillop show that this kind of food-poisoning may also strike hospital patients. As they say, the victims are usually those given light diet. Many of these may suffer severely, and some, especially among those recovering from major abdominal operations, may die from the infection, which does not usually cause a very serious illness in a healthy adult.

In hospitals generally, some of the unexplained outbreaks termed "hospital diarrhœa" might be proved to be due to *Cl. welchii* conveyed by cold chicken if only the appropriate investigations were made. There is nothing technically difficult about isolating and identifying *Cl. welchii*; the hard thing is to persuade doctors and nurses that they should demand a proper investigation of all cases of diarrhœa in hospital. Diarrhœa that is relatively mild and brief is often ignored, or the patient is assured that he has probably had a little too much aperient. Where any bacteriological examination of an outbreak is undertaken, usually only one or two samples of stool are submitted from the few patients whose diarrhœa persists rather longer than that of the others. Salmonellas and shigellas are not found; *Cl. welchii*, even if it is found, is perhaps dismissed as of doubtful significance because most humans carry it in the intestine; and so yet another incident is unhelpfully diagnosed as "hospital diarrhœa". In the investigation of cases of diarrhœa in a hospital ward there is need (as in McNicol

1. McClung, L. S. *J. Bact.* 1945, **50**, 229.

and McKillop's experience) for a full history and a diligent search for an article of food common to all who have had even minor symptoms. Cold chicken is so acceptable a delicacy that it is seldom that any is left over to be examined; instead, the remainder will probably have been shared among some for whom it was not primarily intended. Examination of these also, whether they have symptoms or not, is a necessary and often very helpful part of the investigation. For physical as well as other reasons, however, it often proves difficult to secure for laboratory examination samples of stool from all at risk.

Chiefs of wards do not always realise that, for many reasons, the reporting and investigation of hospital diarrhœa by their staffs is commonly less than adequate. McNicol and McKillop emphasise that they have gained something from the use of rectal swabs to collect the samples they needed. Some evidence reported by Hobbs et al.[2] suggests that examination of rectal swabs for *Cl. welchii* may be less certain of giving a positive result than examination of a sample of stool. Against this, however, use of the rectal swab makes it possible to ensure that a sample is secured for examination from all at risk; and the finding of many *Cl. welchii* in the fæces of an abnormally high proportion of those at risk often constitutes the first real evidence that this form of food-poisoning is the cause of an outbreak of diarrhœa.

In such outbreaks the *Cl. welchii* isolated from the intestines of the patients is often in heat-resistant form (withstanding 100°C for an hour or more) and is often non-hæmolytic on horse-blood agar. Sometimes typing of such strains by agglutinating antisera reinforces the probability of a common source of infection,[2–4] but many strains are still untypable. Moreover it is untrue that *Cl. welchii* food-poisoning is caused only by heat-resistant, non-hæmolytic strains. Nor can it be assumed that the causal organisms, even when they are fully heat-resistant, were necessarily present in the food before cooking. Hobbs et al.,[2] for example, refer to two outbreaks caused by typical hæmolytic strains that were only feebly resistant to heat. Strains of *Cl. welchii* of all kinds are very widely distributed in dust, including the dust of hospital kitchens. McNicol and McKillop suggest that boiled fowls sitting in their own broth in a large container in a hospital kitchen are often exposed to invasion by dust-borne *Cl. welchii*, for which boiled fowls in broth is an excellent medium. This explanation agrees with that of McClung,[1] who emphasised that the cause of trouble in the outbreaks he reported was not lack of refrigeration but failure of the pans of food to cool quickly enough to a safe temperature. Dische and Elek[5] showed that not all strains of *Cl. welchii* cause food-poisoning; otherwise we might experience much more trouble of this kind.

McNicol and McKillop suggest two ways of reducing the risk both from heat-resistant *Cl. welchii* already in the chickens and able to survive cooking and from strains that might gain access after cooking. From both these sources the risk could be curtailed and perhaps removed by cooking the chickens in a pressure-cooker and keeping them sterile by not opening the cooker until the chickens are to be served. If this procedure is unacceptable, the cooked birds should certainly be taken from the broth as soon as possible after boiling and cooled in a place protected from dust—preferably being put into a refrigerator at the first possible moment. To ensure that they cool quickly they should be well separated from each other—on a shallow tray, for example, as recommended by Norval and Collee,[6] who found that slowly cooled steak pies were admirable culture media for *Cl. welchii*. If, through forgetfulness or unawareness of risk, the birds are allowed to remain overnight in broth unprotected from dust and in a mass which cools slowly, diarrhœa may result.

2. Hobbs, B. C., Smith, M. E., Oakley, C. L., Warrack, G. H., Cruickshank, J. C. *J. Hyg., Camb.* 1953, **51**, 75.
3. Smith, J., Wallace, J. M. *Hlth Bull. (Edinb.)* 1956, **14**, 31.
4. Dickie, G. G., Smith, J. *ibid.* 1957, **15**, 81.
5. Dische, F. E., Elek, S. D. *Lancet*, 1957, **ii**, 71.

ANÆSTHESIA IN THE NEWBORN

ANÆSTHESIA for major operations in the newborn is associated with special difficulties. Rees[7] believes that, the respiratory system being relatively immature, controlled ventilation at a high rate is indicated, and that this can be carried out satisfactorily provided that blood-loss is made good and a muscle relaxant is used. The choice of relaxant is important, since the newborn child is sensitive to agents, such as *d*-tubocurarine chloride, that do not depolarise, yet relatively resistant to those that do.[8] Suxamethonium is thus the agent of choice; but, as Rees points out, sensitivity to agents that do not depolarise may go hand in hand with a dual response to those that do, and long-continued administration of suxamethonium may be followed by depressed respiration. This depression can be offset by neostigmine, but it is best avoided or at least decreased by carefully regulating the total dose of suxamethonium. In adults the easiest way to keep the blood-suxamethonium at the minimum necessary level over a long period is to administer it by continuous intravenous infusion; but in a child this would require infusion of far too great a volume of fluid, and intermittent injection is essential. This, by contrast with continuous infusion, is likely to call for a far greater total amount of suxamethonium; and small and frequent doses should be given in order, as far as possible, to mimic continuous administration.

Intubation of the trachea is essential not only because of its importance for controlled ventilation but also because of the difficulty otherwise of maintaining a satisfactory airway. Passage of the tube may be technically difficult when congenital abnormalities are present—especially micrognathia, in which the tongue is held back on the posterior pharyngeal wall by the underdeveloped lower jaw, and subglottic stenosis, which cannot always be discovered before intubation is attempted. Since such factors are likely to prolong the act of intubation, Rees recommends that this should be carried out before anæsthesia is induced and without the aid of a muscle relaxant. Thus, moreover, the danger that vomit may be aspirated is curtailed.

Rees has calculated, on the basis of figures from the Liverpool area, that in the United Kingdom each year some 2000 newborn babies may need major operations—which suggests that these and other anæsthetic problems in the newborn are common enough to merit special study.

Dr. ROBERT PLATT has been re-elected president of the Royal College of Physicians of London for the coming year.

Mr. E. M. T. FIRTH has been appointed Registrar General in succession to Sir George North, who is to retire on April 30. Mr. Firth has been under-secretary and director of establishments at the Ministry of Health since 1947.

6. Norval, J., Collee, J. G. *Scot. med. J.* 1957, **2**, 427.
7. Rees, G. J. *Brit. med. Bull.* 1958, **14**, 38.
8. Stead, A. L. *Brit. J. Anæsth.* 1955, **27**, 124.

Special Articles

RESPONSIBILITIES IN CEREBRAL PALSY

Individuals, Society, and Voluntary Agencies

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CEREBRAL palsy is not a new discovery, but it has aroused general interest in this country only in the past twelve years. In the north of England fresh impetus was given to the study of cerebral palsy when a special school for affected children was opened in Newcastle upon Tyne in 1953. The management committee of this school appointed a medical director to:

(*a*) Maintain an up-to-date register of children with cerebral palsy living in the five northern counties, from which it would be possible to determine the nature of the problems which cerebral palsy presents in this area, the number of children affected, and the facilities which should be provided for their care, education, and treatment;

(*b*) Establish an outpatient clinic for children with cerebral palsy where, in addition to the clinical examination of the child, an assessment could be made of the domestic and social circumstances in which the child lived, and the adjustment of the child and other members of his family to their circumstances;

(*c*) Keep the work of the school and the clinic constantly under review, so that the emphasis of the work could be altered to meet the needs of the five northern counties.

This paper, therefore, is based on experience gained during the past five years in the north of England.

There is some evidence that the incidence of cerebral palsy in this country has risen in recent years. Ingram (1955) has suggested that the higher incidence of cerebral palsy which he found in Edinburgh in the period 1944–49, compared with the period 1938–43, was due not only to improvements in infant care in the neonatal period but also to survival of infants after illnesses which would formerly have been fatal. The infant-mortality rate in England and Wales fell steadily from 150 per 1000 in 1900 to 23 in 1957. It seems inevitable that, along with this tremendous saving of infant life, a number of brain-injured children, who would previously have died, are now helped to survive, and that cerebral palsy is part of the price which the community must pay for the considerable improvements which have taken place in obstetric and pædiatric practice in the past fifty years.

It is now generally agreed that cerebral palsy is a comprehensive term, covering a large number of conditions, with a variety of ætiological factors. Knowledge about these factors has increased very slowly in the past century, and it seems unlikely that any spectacular advance will result from further retrospective studies. Useful information may, however, be accumulated from long-term prospective studies. Meanwhile, pressing problems are presented by those who suffer from cerebral palsy, and its management calls for careful attention. If cerebral palsy is part of the price which the community must pay for improved obstetric and pædiatric care, how must the price be paid?

Individuals

Parents

Cerebral palsy implies delayed motor development, which in most children is first recognised by the parents. The more severely affected the child, the earlier is the abnormality noticed. As it is usually the parents who take their child to their doctor for advice, the parents may be considered the first link in the chain of management.

It is the duty of the doctor to explain the significance of the diagnosis to the parents and to advise them about the management of the condition. It remains the parents' responsibility, aided by this advice, to care for their child at home day by day and year by year. Theirs indeed is often a hard task. They must maintain their understanding and their interest, in the face of an increasing physical burden and of their anxieties for the future. They will always have to accept more than normal responsibility for their child. If they can do so, they can help him to make the most of his disabilities. If they are overwhelmed by their burden, if they neglect or abandon their child, he is indeed "deprived", not only of a normal home life, but of the chance of ever living outside the artificial atmosphere of an institution. It may well be said that the most important factor in the life of a young disabled child is the attitude of his parents to his disability.

Doctor

The doctor must help the parents to play their most important role by bringing them gradually to understand, and later to accept, the full significance of the diagnosis. He must always be available to give explanation and advice as each new situation is encountered.

A hospital specialist who has a particular interest in cerebral palsy is usually the doctor who should give most of the initial explanation and advice. He, too, may best be able to advise about treatment, while at a later stage a school medical officer can help with educational difficulties. The advice of several specialists may be needed, about the child's vision, his hearing, or his intelligence, but for most parents their family doctor, because he is the doctor who knows the family best, is the doctor best qualified to give them continuing help, and he should remain as a link, interpreting the experts to his patients.

Therapist

As interest in cerebral palsy becomes widespread, the diagnosis can be made at an increasingly early age. As knowledge slowly accumulates, it is becoming accepted that a large proportion of those with cerebral palsy have only limited intelligence. The challenge to the therapist at the moment is to find a way of helping young children and backward children, as well as older children of normal intelligence.

The word treatment, applied to cerebral palsy, is potentially dangerous, because to many parents treatment implies a prospect of cure, and this blinds them to the incurable nature of the condition. Therapists who wish to help children with cerebral palsy must have a clear understanding of the way in which a normal infant develops. Only then will they be able to recognise abnormal development. The study of the normal infant should lead on to a study of the abnormal movements in children with cerebral palsy. The mechanisms which control these abnormal movements are set below the cortical level. These mechanisms can therefore be used or modified by the therapist in young children, or mentally defective children, who are unable to cooperate; but for the achievement of voluntary control of fine or complicated movements intelligent cooperation by the patient is necessary.

Therapists must not concentrate on motor development alone. Because children with cerebral palsy move very little, their knowledge of their environment is limited.

Sensation, or sensory perception, may be abnormal, so that the young child lacks the normal stimuli which are necessary for normal intellectual development. Whether this delay by deprivation can ever subsequently be corrected remains in doubt, but it seems logical to widen the sensory experience of young children with cerebral palsy, not only by encouraging normal movements, but by using suitable toys and materials such as dough, plasticine, sand, and water. At this point the therapist is trespassing on the preserves of the nursery-school teacher, but instead of regarding the two individuals as having separate functions, it would be preferable to regard them both as encouraging a single process of continuing motor and sensory development. This approach to the management of cerebral palsy, which is strange to many therapists trained by conventional methods, calls for much observation and study, but it may yield results in cerebral palsy of all grades of severity and at all ages.

It would be unfortunate indeed if, as the result of so much specialisation, the therapists came to regard themselves as experts essential for treatment. It is not uncommon for children to be brought frequently from distances to attend crowded treatment departments, where their mothers are given a seat in a waiting-room while the child receives the expert attention of the therapist in an inner room. This method of treatment may be the result of a constant urge to do something for the child. In many cases it may meet to some extent the emotional needs of the parents, but far better that the time should be spent with the mother or father explaining the ways in which they can modify their child's development at home. By teaching the parents in this way the therapists can ensure daily help for the child. By taking the parents into her confidence the therapist can lessen their sense of frustration and can substitute for it a sense of achievement and pride in their child's progress.

Society

Welfare Services

One of the results of cerebral palsy is social isolation. The affected child is prevented by his disabilities from making normal contacts with other children and is thrown back upon the resources of his parents and his family. Because their child is so abnormally dependent upon them, the parents themselves become socially isolated. Recreation away from their home, either during the evenings or at holiday times, may be impossible for them. This is a particular strain on the mother whose daily routine ties her to her home.

The presence within a family of a severely disabled child may place a great strain upon the bonds which unite the family. If these children are to benefit from home life, the break-up of their families must be prevented. Even in the welfare state it is impossible to find for the disabled child an adequate substitute for home care.

Cerebral palsy must therefore be recognised, and accepted by the community, as a social problem, so that appropriate welfare services, such as social clubs and holiday homes for affected children, and home helps or sitters-in for their parents, can be provided to meet the real needs of these children and their families. The alternative to providing these welfare services is to provide a series of residential nurseries, residential schools, and institutions, where the patient can live from the time in infancy when the diagnosis is made until the day in adult life when he dies. This policy of segregation—of institutional care from the cradle to the grave—is not only economically unsound, but also emotionally and psychologically wrong for the child, his parents, and the community in which they live.

Schools, Occupation Centres, and Institutions

To fit children with such a wide variety of motor, sensory, and intellectual disabilities into any educational system, it is clear that a wide variety of schools is needed. The following type of provision was made in 1953 and 1954 for the 133 children of school age with cerebral palsy who lived in three representative local-authority areas in the north of England:

Type of provision	*No. of children*
At home	24 (18%)
Home tuition	4 (3%)
Normal school or open-air school	70 (53%)
School for the educationally subnormal	3 (2%)
Special school for children with cerebral palsy	17 (13%)
Private school	2 (2%)
Occupation centre	3 (2%)
Institution	10 (7%)
Total	133

53% were attending normal schools or open-air schools. It may be argued that this is not an unreasonable figure, bearing in mind the fact that over half of all cerebral palsied children have only a mild motor disability. If a child with a physical handicap can manage, and benefit from education, at a normal school, he would better do so than be admitted to a special school where he would be mixing with children more severely handicapped than himself. Yet subsequent experience suggests that about a third of those children with cerebral palsy who were attending normal schools or open-air schools had specific learning difficulties or were so backward that they needed more individual help than their teachers could afford to give them.

Only 2% of the 133 children of school age were attending a school for educationally subnormal children. There is in the northern region, as throughout the rest of the country, a shortage of accommodation of all kinds for backward children, in special schools for the educationally subnormal, in occupation centres, and in institutions. This shortage is a particular hardship to the cerebral-palsy population, because it includes a relatively larger number of backward children than does the rest of the population.

Below is an estimate, based on the combination of motor disability and intelligence of the 133 children who lived in the three representative local-authority areas, of the provision needed for children of school age with cerebral palsy:

	Percentage
Normal school or school for physically handicapped pupils	30
Class or school for the educationally subnormal	24
Occupation centre	8
Institution	8
Special school for children with cerebral palsy	12
Special occupation centre for children with cerebral palsy	18
Total	100

Special provision should be made for two types of cerebral palsied children. Special schools are needed, admitting children with a combination of severe physical disability and normal intelligence. This combination accounts for only 12% of all children with cerebral palsy, and it is unfortunate that these special schools have received so much publicity in recent years. This publicity has obscured the great need to provide for the heavily handicapped child who, though trainable, is prevented by his poor intelligence from benefiting from any sort of education, and whose parents, if given some relief, can still manage to care for him at home. This second type of special provision should be in a special occupation

centre, equipped to care for, to train, and to treat backward children with severe physical disabilities.

Although buildings have an important part to play in the management of children with cerebral palsy, it is not the buildings and the accommodation within them that matter, so much as the personalities of those who care for the children and who attempt to help their families. Personalities are always more important than bricks and mortar, and personalities are particularly important in the management of children with cerebral palsy.

Voluntary Agencies

Parents' Associations

Associations of parents of disabled children have three important functions:

The first is to help its members to accept the inescapable fact of their children's disabilities. Parents have a very important part to play in the management of their children, and they cannot be expected to play this part satisfactorily while they remain confused and frustrated. Acceptance of the inescapable eases tension and enables the best use to be made of available resources.

The second is to create a well-informed public opinion. This in turn will ensure that official help will be forthcoming to meet the needs of all disabled children.

The third is self-help in cooperation with local authorities. Most local authorities are willing, but unable, to meet all the needs of the disabled. Parents can help by providing additional facilities in schools and clinics.

In the past ten years associations of parents of spastic children have sprung up throughout the country, until there are now in England and Wales over a hundred local parents' associations. These associations have been quick to realise that publicity is a powerful weapon, and by means of their publicity they have achieved a nation-wide interest in cerebral-palsied children. They have also been slow to realise that publicity, because it is so powerful, is also dangerous, particularly to themselves. Many of the statements that have been published on behalf of the parents' associations have been inaccurate or over-optimistic. There appears to be an urgent need to impress on some parents' associations some of the fundamental facts of cerebral palsy. If the parents can be helped to accept these facts, they will be in a better position to help their fellow members and to create a well-informed public opinion.

The parents' associations have used considerable initiative to raise large sums of money from a sympathetic public. It is much easier to raise money for cerebral palsy than to spend it wisely, and much money may be wasted in providing facilities before the needs are accurately defined.

Voluntary Societies

Although in recent years interest in cerebral palsy has spread widely, knowledge of the subject has lagged far behind, and many aspects remain unexplored. Knowledge of its causes has advanced only a short way beyond the stage reached by Little (1862) nearly a century ago. In the past fifteen years several attempts have been made to determine the size of the problems presented by cerebral palsy, and to plan what is needed for their management. More recently several interesting methods of treatment have been used.

The cause of cerebral palsy must be investigated in maternity hospitals and pathology laboratories. Voluntary societies can assist these carefully planned long-term studies by means of research grants. The management of patients with cerebral palsy must be investigated largely outside hospital and laboratories because it is concerned with the natural history of the condition and the effect which it may have on the child, his parents, and his family. This type of investigation demands a flexible approach and is best conducted by clinical scientists, educationalists, and welfare workers, supported by a voluntary society with an interest in cerebral palsy. It is probable that those who work in this way will be in the best position to collect information about the medical, educational and social problems which cerebral palsy presents, and to supply it to all who are interested in this branch of social service.

Summary

As obstetric and pædiatric care has improved in this country, it seems likely that the incidence of cerebral palsy has increased. Although prevention is important, management of the condition presents more pressing problems.

The most important factor in the life of a young disabled child is the attitude of his parents to his disability. Doctors, therapists, and teachers must help the parents to care for their children at home. To overcome the social isolation which this entails, improved welfare services are needed.

In this country there is still a shortage of accommodation in schools and institutions for backward children. This is a particular hardship to the cerebral-palsy population which contains a large proportion of backward children. More accommodation should also be provided in special schools and special occupation centres.

In their concentration on the child and his disabilities, the parents' associations have tended to ignore the fact that the parents themselves often need as much help as their children.

Much remains to be learned about the great variety of disabilities included in the term cerebral palsy. The necessary inquiries can best be supported by voluntary societies having an interest in this branch of social service.

I am indebted to Dr. F. J. W. Miller, reader in social pædiatrics in the department of child health, University of Durham, for much helpful criticism in the preparation of this paper.

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HEALTH SERVICE ESTIMATES

THE estimated gross total cost of the National Health Service [1] in England, Wales, and Scotland in 1958-59 is £677,679,845, compared with £649,322,885 in 1957–58. Appropriations-in-aid are estimated at £146,967,415, compared with £103,991,920 (an increase of £42,975,495), bringing the estimated net cost to £530,712,430, compared with £545,330,965 in 1957–58 (a decrease of £14,618,535). The cost of the hospital, specialist, and ancillary services is estimated at £434,758,709 in 1958–59, compared with £415,272,655 in 1957–58 (an increase of £19,486,135); under this heading advances to boards' revenue accounts are estimated at £398,595,000, compared with £382,660,150 (an increase of £15,934,850). General medical, dental, pharmaceutical, and supplementary ophthalmic services are estimated to cost £190,350,110 in 1958–59, compared with £184,496,980 in 1957–58 (an increase of £5,853,130). Grants to local health authorities are estimated at £30,797,800—an increase of £1,808,800 on the £28,989,000 in 1957–58.

1. Civil Estimates for the year ending March 31, 1959. Class V: Health, Housing, and Local Government. H.M. Stationery Office. 9s

THE LISTER FESTIVAL

THE triennial Lister oration of the Royal College of Surgeons of England was given on March 28 by Sir Stewart Duke-Elder. An account of it appears on page 781.

In the evening, at the Lister festival dinner, Sir JAMES PATERSON ROSS, the president, said that the chief festivals of the college are named after John Hunter and Joseph Lister, " the greatest of our forefathers ". Hunter by the experimental method had been the father of scientific surgery; but surgery remained dangerous and limited until Lister made it safe for the patient; and not until physiologists showed how the body reacts to operations was the patient made safe for surgeons. Lister would be staggered by the increase in the scope of surgery since his time, and he would be bewildered by the intense activity of the college, which he knew as a quiet institution. Setting, by its examinations, a scientific standard which benefits patients all over the world, the college had had to undertake postgraduate teaching because most medical schools are fully occupied with undergraduates. It provided what amounts to an honours course in surgical specialties; and Lister would have approved its association with the University of London, whereby professors in the college are also teachers in the university. Besides teaching, the college, through its research laboratories, had an eye to the future, and to the possibilities of preventive as well as curative surgery. All this work could not be carried through unaided, and the President spoke gratefully of the many friends who believe in its cause—mentioning among others the benefactions of Sir Simon Marks and his associates, the Wellcome Trust, the Leverhulme Trust, the British Oxygen Company, Imperial Chemical Industries, Lord Nuffield, and Mr. Edward Lumley. The history of the college was such that it has no need to build for aggrandisement; but to be true to its heritage it must fulfil its trust.

Sir James was responding to the toast of The College proposed by VISCOUNT CROOKSHANK. The toast of The Lister Orator was given by Sir ARCHIBALD MCINDOE, vice-president, who said that Sir Stewart Duke-Elder has earned and won more academic distinctions than any other man in British medicine, while the affection in which he is held would presently be shown by a celebration of his 60th birthday. To the Institute of Ophthalmology, the love of his life, he had contributed a tremendous amount, and the institute in its turn had contributed a tremendous amount to the Commonwealth. In his reply Sir STEWART said that he was proud to be chosen as orator, and glad also for the sake of ophthalmology—the subject in which Lister did his first piece of research.

The guests were welcomed by Sir RUSSELL BROCK, vice-president, who had clearly left part of his heart in Australia, which must be visited if a surgical education was not to remain incomplete. What the American in Nevil Shute's book said of Australian scenery—" this is beautiful all right, by any standard in the world "—was true, he felt, of every aspect of Australian national life.

Sir CHARLES WHEELER, P.R.A., comparing sculpture with surgery, said that sculptors are often asked " What do you do if you cut away something you really want? "—to which the answer was " we never do ". He wondered what surgeons did in such circumstances: certainly the specimens of their work walking about the streets seemed to compare favourably with some modern pieces of sculpture. Though many art schools now dispensed with anatomy, the Royal Academy, where William Hunter had been first professor of the subject, still believed in it: they felt that holes cut in the human torso ought to be filled up. Quoting Hamlet's passage, " What a piece of work is a man . . . the beauty of the world . . . the paragon of animals," Sir Charles added: " That is the material that you work on and we work on." Knowledge was not enough: there was need, too, of the mysterious something which art supplies. In each profession there were those whose art transcends knowledge and makes for genius—having a sense of the whole drama of human existence. One such was Lister.

Public Health

FOOD-POISONING CAUSED BY CLOSTRIDIUM WELCHII IN COLD CHICKEN

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ALTHOUGH diarrhœa due to *Clostridium welchii* was first described over sixty years ago (Klein 1895) and attention has been drawn in recent years to food-poisoning caused by heat-resistant strains, this organism is not always sought even when an outbreak of diarrhœa in hospital is being investigated.

The typical symptoms come on 8–20 hours after the infected food has been eaten (Hobbs et al. 1953) and are highly suggestive though not pathognomonic. If the necessary bacteriological examination is not undertaken, the outbreak is given some non-specific label such as " hospital diarrhœa ".

One of us (E. J. McK.) has investigated many cases of diarrhœa in hospital, and on five occasions in the past two years has noted a clear association between *Cl. welchii* food-poisoning and cold chicken in the diet. This hazard to patients in hospital is illustrated by the outbreak reported here.

The Outbreak

Clinical Features

About 8 P.M. on Aug. 6, 1957, 9 patients in a medical unit of thirty-nine beds developed a brief illness characterised by profuse diarrhœa and lower abdominal colic with disproportionately slight general upset. By the next morning all had recovered. No specific therapy was given. Diarrhœa was confined to the 15 taking light diet, among whom 9 were affected; the patients who ate special or ordinary diets were not affected. The maid attached to the ward (case 16) also developed severe diarrhœa on the same evening. The only item of food common to the patients and the maid was cold chicken, which was served at noon to those on light diet only. The maid had eaten the chicken left over from the patients' lunch, and no samples of this food were therefore available for examination.

Bacteriological Investigations

On the morning of Aug. 7, when the diarrhœa had almost completely settled, rectal swabs were taken from all 16 persons who had eaten the chicken.

Each swab was plated directly on two horse-blood-agar plates and on MacConkey's medium. Three tubes of Robertson's cooked-meat medium were then inoculated, followed by one tube of Robertson's cooked-meat medium with 10% sodium chloride and one tube of selenite-F medium. One blood-agar plate was incubated anaerobically; all the other media were incubated aerobically. One tube of Robertson's medium was boiled for fifteen minutes before incubation, and another for an hour; the third was not heated before incubation. Previous experience has shown that positive results are obtained after fifteen minutes' boiling of the fæces in a few specimens when they are not obtained after the more usual hour's boiling.

Next day the anaerobic blood-agar plates were examined for hæmolytic and non-hæmolytic *Cl. welchii*. Further strains were isolated by plating both the heated and the unheated tubes of Robertson's medium on to horse-blood-agar and incubating anaerobically. The identity of all the cultures of *Cl. welchii* was confirmed by showing that they produced α-toxin (lecithinase), and that this was specifically neutralised by *Cl. welchii* α-antitoxin. This test was done in tubes containing lecithovitellin prepared by the method of Macfarlane et al. (1941).

Staphylococci were isolated from the Robertson's medium containing 10% sodium chloride by plating on to blood-agar and incubating aerobically. Fluid cultures of suspected colonies were tested for the production of coagulase by a tube test with human citrated plasma. All further references to *Staph. aureus* or staphylococci in this paper denote coagulase-positive *Staph. aureus*.

The MacConkey's medium and the selenite-F medium were investigated in the usual way for intestinal pathogens. None of the specimens contained salmonellas or shigellas.

Non-hæmolytic heat-resistant *Cl. welchii* was isolated from 11 and *Staph. aureus*, in small numbers only, from 7 of the 16 rectal swabs examined (table I). Both hæmolytic and non-hæmolytic strains of *Cl. welchii* were

TABLE I—NON-HÆMOLYTIC HEAT-RESISTANT *Cl. welchii* AND COAGULASE-POSITIVE *Staph. aureus* IN FÆCES OF ALL AT RISK FROM EATING COLD CHICKEN

Case no.	Symptoms of diarrhœa	Heat-resistant *Cl. welchii* (15 min. or more at 100°C)	*Staph. aureus*
1	−	−	−
2	−	−	−
3	−	+	−
4	−	+	+
5	−	−	−
6	−	+	+
7	+	+	+
8	+	+	−
9	+	+	+
10	+	+	−
11	+	+	−
12	+	−	−
13	+	−	+
14	+	+	+
15	+	+	+
16	+	+	−
Total	10	11	7

isolated from a large proportion of the cultures (12 of the 16). Of the 10 people with diarrhœa 8 had non-hæmolytic heat-resistant *Cl. welchii* in their stools.

Serological typing of all the non-hæmolytic strains of *Cl. welchii* isolated, including the proved heat-resistant strains, was carried out by Dr. Betty Hobbs of the Food Hygiene Laboratory of the Central Public Health Laboratory at Colindale. Of the thirty-six strains examined, thirty were untypable by the available sera. Untypable non-hæmolytic *Cl. welchii* was isolated from 12 of the 16 persons at risk, and non-hæmolytic heat-resistant untypable *Cl. welchii* from 9, of whom 8 had diarrhœa. From 2 of the 3 who carried heat-resistant *Cl. welchii* without having diarrhœa, the organisms isolated were of different serological types—type 5 and type 8. Possibly these two typable strains may have been unconnected with the diarrhœa.

The staphylococci isolated from seven of the sixteen specimens proved to be of a wide variety of strains (table II) and were present in small numbers only, being isolated from enrichment but never from direct cultures.

A month after the outbreak (Sept. 13), when there was no diarrhœa, rectal swabs were taken from 16 patients in the unit, irrespective of the type of diet they were eating. Only 1 patient who had been in the ward during the outbreak was sampled during this second investigation. This sample was taken to provide a control observation. The results of these cultures differ strikingly from those examined at the time of the outbreak. A heat-resistant strain of *Cl. welchii* was found in only 1 of the 16 patients examined, and *Staph. aureus* in only 2.

TABLE II—ANTIBIOTIC SENSITIVITY AND BACTERIOPHAGE TYPE OF *Staph. aureus* ISOLATED DURING OUTBREAK

Case no.	Antibiotic sensitivity					Phage-type
	P	C	T	St	E	
4	R	S	S	S	S	6w/7/75+
6	R	S	R	R	S	53 (1000×R.T.D.)
7	S	S	S	S	S	N.T.
9	S	S	S	S	S	7+
13	R	S	S	S	S	47/53/75/77
14	R	S	R	S	S	7/53/75+ (1000×R.T.D.)
15	S	S	S	S	S	N.T.

P, penicillin
C, chloramphenicol
T, tetracycline
St, streptomycin
E, erythromycin
N.T., non-typable
S, sensitive
R, resistant

Discussion

The clinical picture was typical (Hobbs et al. 1953). About eight hours after the ingestion of pre-cooked meat there was a brief illness characterised by colicky lower abdominal pain and diarrhœa. The motions were watery and unformed but contained no mucus, blood, or pus. There was no pyrexia, and systemic upset, as usual, was minimal.

In the healthy adult this illness is merely an inconvenience, but in those already ill it may be prostrating, if not fatal. When the illness is mild it is usually settling before note is taken of it, and complete investigation, including the food, is seldom possible. Even in the present outbreak, in which food-poisoning was suspected early, samples of the suspected food could not be obtained. This appears to be a not uncommon experience (Dickie and Smith 1957).

Non-hæmolytic heat-resistant *Cl. welchii* was isolated from 11 of the 16 people exposed in this outbreak, and 9 of the 11 strains were untypable with Dr. Betty Hobbs' sera. The proportion of those with diarrhœa from whom an untypable strain was isolated (80%) corresponds to the previously reported figures for *Cl. welchii* food-poisoning (89% by Hobbs et al. 1953) and is in keeping with the results reported for experimental *Cl. welchii* food-poisoning (97% by Dische and Elek 1957). It seems quite probable that this outbreak was due to an untypable strain of heat-resistant *Cl. welchii*.

In the present outbreak the only item of diet taken by all the 10 persons with diarrhœa was cold chicken, and, though we have no direct bacteriological proof, it seems likely that this was responsible for the food-poisoning. Cold chicken has already been noted as a potential source of *Cl. welchii* food-poisoning (McClung 1945).

It has not yet been possible to establish with certainty how and when the chicken is contaminated with *Cl. welchii*, and this problem is at present being investigated.

We found no evidence in laboratory experiments that chicken is a more favourable medium than other meat dishes for the growth of *Cl. welchii*, but the methods of cooling and storing boiled fowls often provide suitable conditions for the growth of such organisms.

After cooking, the chicken may be left to cool in the broth, the two of which together provide an admirable medium for the growth of any *Cl. welchii* that survives cooking or may subsequently gain access. This is especially so in large kitchens such as

hospital kitchens where many fowls may be cooked at one time and left to cool together with the broth in one container. The mass of recently cooked chickens maintains a temperature favourable to bacterial growth for many hours particularly if the container is left at room temperature. During transfer from the cooking-pot to the cooling container and during cooling they are liable to be exposed to hospital dust, which is heavily infected with *Cl. welchii*. The risk could be reduced either by cooking the chickens in a pressure cooker and keeping them sterile in this container until the time for serving them or by removing the birds from the broth after boiling and refrigerating them immediately and well separated from each other on shallow trays.

Though contaminated, the chicken usually appears to be perfectly acceptable when served, and is regarded as palatable; on occasions it appears to be slimy, but it has never been foul-smelling or frankly putrid. Thus it is served and eaten without hesitation, and the remnants are usually eaten or discarded before the onset of diarrhœa. Patients who are receiving light diet are particularly liable to be affected, for cold chicken is an important part of their diet; these are the very patients liable to be most upset by such an episode.

When diarrhœa was present, a wide variety of strains of *Staph. aureus* was found in the stools of 7 of the 16 persons examined; in the control period they were found in only 2. This is a considerable difference, but one of us (E. J. McK. unpublished work) investigating many cases of hospital diarrhœa has observed that the incidence of *Staph. aureus* in fæces is higher in patients with diarrhœa, whatever the cause, than in patients without diarrhœa. We think that this is the explanation for our findings in respect of *Staph. aureus* and we do not hold the staphylococci responsible for the diarrhœa.

In the present investigation the use of rectal swabs proved satisfactory, and in this type of outbreak the rectal swab has much to commend it. All the persons at risk were examined with great convenience and complete certainty, whether they had diarrhœa or not. Investigation did not depend on the chance that a sample of stool would become available at a convenient moment and that someone would remember to send it for laboratory examination. An investigation of all at risk was thus possible. It may be that, as indicated by Hobbs et al. (1953), the negative results in the 2 patients with diarrhœa were due to the use of rectal swabs, but we think that the completeness of the sampling justifies the use of this method.

Summary

A brief outbreak of " hospital diarrhœa " is described. It was due to heat-resistant *Clostridium welchii* carried by cold chicken.

Hospital patients whose diet contains cold chicken tend to be those given light diet.

These are the very patients in whom even a brief attack of diarrhœa may be particularly troublesome.

Our thanks are due to Dr. T. N. Fraser for allowing us to report this investigation of patients under his care, and to Dr. Betty Hobbs for the serological typing of all the numerous strains of heat-resistant *Cl. welchii* from this outbreak.

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Scotland: Increasing Mortality in Older Men

THE report of the Department of Health for Scotland [1] draws attention to the smudge on the generally satisfactory picture of that country's health: while the death-rate is falling in all other groups, that in men in the second half of life is rising. This increase cannot be attributed to the rising age of the population, and it means that some morbid process or processes must be on the increase. At these ages " there are very few causes of death that do not affect males more than females ", but the chief causes are the heavier liability of men to lung cancer and to cardiovascular disease, especially coronary thrombosis. " Were it not for these two causes the male death-rate would be declining at approximately the same rate as the female although remaining at a higher level."

In Scotland the mortality from all causes in men aged 55-64 has risen over the past ten years; but in England and Wales the rate in this group has remained about the same, though the rate in men aged 65 and over has increased. In England and Wales the rate remains much the same, though fluctuating, in women aged 75 and over, and has fallen in all other age-groups.

The general improvement in younger people is exemplified by the infant-mortality rate, which in 1957 remained at the previous year's low record, the stillbirth and maternal-mortality rates, which were the lowest ever, and the tuberculosis death-rate (13 per 100,000, compared with 66 per 100,000 ten years previously). The number of notifications of tuberculosis rose from 5915 in 1956 to 7859 in 1957, because of the mass-radiography campaign, in which 1,319,867 people were radiographed.

After cardiovascular disease and cancer, accidents caused most deaths in Scotland. Bronchitis was the fifth commonest cause of death but caused most absence from work. The influenza epidemic was a relatively benign one, but there were 90 deaths from it in one week—a figure rarely exceeded before. Children's teeth continue to give cause for concern; at dental inspections of children aged 12, 20–30% of all teeth were recorded as missing, decayed, or filled.

Outbreaks of Staphylococcal Infection

BECAUSE of staphylococcal skin infections in newborn babies, the maternity ward of the Southern General Hospital, Glasgow, is being closed. There is no reason to believe that there is any connection with the outbreak in the Royal Maternity Hospital, Glasgow, three months ago, when 2 babies died.[2] The ward is emptying gradually as patients become fit to be moved; no new patients will be admitted till the ward has been disinfected. Castle Hill Maternity Hospital, Shaftesbury, Dorset, has also been closed and disinfected because of an outbreak of skin infection in babies.[3]

Clean Air Act

THE Minister of Housing and Local Government has laid before Parliament regulations [4] setting out the exceptions to the ban on dark smoke.[5] The exceptions are designed to allow for such essential operations as cleaning the fires of furnaces, which may necessarily involve emission of dark smoke for short periods. Further regulations [6] add certain industries to those controlled by the Alkali Act rather than the Clean Air Act.

River Pollution

THE Rivers (Prevention of Pollution) Act, 1951, required the consent of the Minister of Housing and Local Government before a river board might take proceedings under the Act for pollution caused by sewage or trade effluent. This requirement was limited to seven years, but the report [7] of the trade effluents subcommittee recommends extension of the period by three years to 1961.

1. Report of the Department of Health for Scotland for 1957, Cmd. 385. H.M. Stationery Office, 1958. Pp. 150. 7*s*.
2. *Scotsman*, April 2.
3. *Liverpool Daily Post*, April 2.
4. The Dark Smoke (Permitted Periods) Regulations, 1958. S.I. no. 498. H.M. Stationery Office. Pp. 2. 3*d*.
5. See *Lancet*, Feb. 15, 1958, p. 371.
6. The Alkali, &c., Works Order, 1958. S.I. no. 497. H.M. Stationery Office. Pp. 3. 3*d*.
7. Ministry of Housing and Local Government: First Report of the Trade Effluents Subcommittee of the Central Advisory Water Committee. H.M. Stationery Office. 1958. Pp. 9. 9*d*.

Medicine and the Law

Diminished Responsibility

THE Court of Criminal Appeal gave its reasons for allowing the appeal of a labourer, aged 52, who was convicted of the capital murder of a 15-year-old boy. The defences put forward were: (1) that in killing the boy the accused was suffering from diminished responsibility as defined by section 2 of the Homicide Act, 1957, and was accordingly not guilty of murder but of manslaughter; (2) that the murder was not in the course or furtherance of theft (as alleged by the prosecution) so that even if the defence of diminished responsibility was not accepted the murder was not capital. On March 24 the court allowed the appeal on the first ground and substituted a verdict of manslaughter.[1]

The LORD CHIEF JUSTICE said that the second ground of appeal need not be considered and the court gave no decision on it. The accused was a confirmed practising sodomite and there was evidence of some association between him and the boy, who was not seen alive after 4.30 P.M. on Nov. 18, 1957, when he left a new job, having previously collected wages due to him from a former employer. The boy's mother received three anonymous postcards, the first of which stated that the boy had gone to London as a woman was after him, the second that he was living in London with prostitutes, and the third that he was dead. All three were written by the accused, who also wrote anonymously to the police to say that the boy's body was in the Tyne, and also accusing the boy of sodomy. On the same day, he gave himself up to the police and described how he had killed the boy by smashing his head with a glass bottle filled with water and then with a claw hammer. That was confirmed by postmortem examination. The body was found cut in half and disembowelled and stowed in a sump under a boxing hall in Newcastle. The accused, in a statement to the police, alleged that he had killed the boy because the boy was demanding money from him. He also stated that he had killed the boy for his wages.

On the issue of diminished responsibility none of the facts were disputed. The defence called three medical witnesses: Dr. I. G. W. Pickering, the senior medical officer of Durham Gaol; Dr. R. Orton, consultant psychiatrist at Newcastle General Hospital; and Dr. T. M. Cuthbert, physician-superintendent of St. Luke's Hospital, Middlesbrough, all three of whom had personally examined the accused. The prosecution did not challenge the opinions they had formed. All agreed that he was not insane within the McNaughten rules; but they were all satisfied that his mind was so abnormal as substantially to impair his mental responsibility, and gave their reasons for that opinion. The evidence was clearly enough to shift the burden of proof thrown on the defence by section 2 of the Act of 1957; yet no medical evidence was given by the prosecution in rebuttal.

What were the facts or circumstances which would justify a jury in coming to a conclusion contrary to the unchallenged evidence of those gentlemen? While emphasising that the decision in these cases, as in those in which insanity was pleaded, was for the jury and not for the doctors, the verdict must be founded on evidence. If there were facts which would entitle a jury to reject or differ from the opinions of the medical men, the court would not, and indeed could not, disturb their verdict; but if the doctors' evidence was unchallenged and there was no other on that issue, a verdict contrary to their opinion would not be a true verdict in accordance with the evidence. Here there was evidence of premeditation; but an abnormal mind was as capable of forming an intention and desire to kill as one that was normal; it was just what an abnormal mind might do. The revolting nature of the crime itself would cause most people to say that it was the work of a maniac, and the court could well understand that a jury faced with such a crime committed by a sodomite would think that such a creature ought not to live, and that a verdict involving a capital sentence was the only one appropriate. But Parliament had altered the law and decreed that if killing was committed by a person whose abnormal mind had seriously diminished his responsibility, the verdict was to be manslaughter and not murder. The Criminal Appeal Act, 1907, directed the court to allow an appeal if they thought that the verdict of the jury should be set aside on the ground that it was unreasonable or could not be supported by the evidence. Having regard to what they thought must have affected the minds of the jury the court would not care to say that the verdict was unreasonable, though they felt bound to say that it was not supported by the evidence. The fact was that there was unchallenged evidence that the accused was within the provisions of section 2 of the Homicide Act and no evidence that he was not.

REGINA *v.* MATHESON. *Court of Criminal Appeal:* Lord Goddard, *C.J.*, Streatfeild, Slade, Donovan, and Havers, *JJ.* April 1, 1958. George Waller, Q.C., and Peter Taylor (registrar, Court of Criminal Appeal); P. Stanley-Price, Q.C., and R. Rawden-Smith (Director of Public Prosecutions).

E. M. WELLWOOD
Barrister-at-Law.

1. See *Lancet*, April 5, 1958, p. 736.

Length of Pregnancy

A husband and wife resided in Kenya. In December, 1954, they ceased to live together and the wife returned to England. The husband spent a leave with her in England between April 22 and May 14, 1955, and sexual intercourse took place on the first or second night of that leave. In the early morning of Dec. 2, 1955, the wife gave birth to a 6 lb. child at a nursing-home. Subsequently the husband ceased to maintain the wife and she applied for an order against him on the ground of his wilful neglect to provide her with reasonable maintenance. The husband alleged that he was not liable to pay maintenance since, inter alia, the wife had committed adultery with an unknown man in about February or March, 1955, as a result of which the child was born; he asked the court to infer that the child was not his as, after December, 1954, no intercourse had taken place between him and his wife save during the leave period, and the child was a normal full-time child without any signs of prematurity.

Mr. Justice COLLINGWOOD said that the matron of the nursing-home at which the child was delivered had said in evidence that she had no doubt that it was a full-time child. The medical experts who had given evidence were in agreement as to the signs of prematurity but disagreed as to whether all or any of them would have been present.

Dr. C. G. Nairn, on behalf of the wife, had said that all or any of the recognised signs of prematurity would not be necessarily present in any one given case, and that none of them would invariably be present; that the textbook average of a 280-day period of gestation was reckoned from the onset of the last menstrual period but that the expected date of birth could not be worked out by reference to the date of sexual intercourse alone, and it was necessary to go back to the first day of the preceding menstrual period and add 280 days which would then give an approximate date of delivery at the best. Dr. Nairn's view was that to the 224 days (April 22/23 to Dec. 2) 21 days could be added, that was a total of 245 days of fœtal life, and, where, as in the present case, there was evidence of irregularity in periods, he would add 26 days in the absence of definite evidence as to the presence of a menstrual period —which would bring the total up to 250 days. He had said that assuming that there was a proper menstrual period and that 21 days only had to be added, a fœtus of 245 days duration would not necessarily be so premature as to be obvious, he would call it an eight-month child and from his experience it was impossible to distinguish an eight-month from a nine-month child with any certainty. He agreed with *Taylor's*

Medical Jurisprudence [1] and with the evidence given by Dr. Roques in *Clark* v. *Clark* [2] where it was held that a child born 174 days after the earliest date when intercourse could have taken place could be legitimate. Dr. G. H. Dodds, who had been called for the husband, had not agreed with the statement in *Taylor* nor with the evidence of Dr. Roques; she would not admit the possibility that the child could have been the result of intercourse on April 23, 1955, and yet show no signs of prematurity. She agreed that it was permissible to add 21 days, but not that one must do so.

The question for His Lordship was whether the medical evidence had satisfied him beyond reasonable doubt that the wife had committed adultery. The answer was that it had not. He could not disregard the evidence of a witness of the experience and status of Dr. Nairn and accepting this evidence, he was satisfied that the child born on Dec. 2, 1955, could have been the result of intercourse on April 22/23, 1955.

BURGESS *v.* BURGESS.—*Probate, Divorce and Admiralty Division;* Collingwood, J.: March 27, 1958. R. A. J. Temple, Q.C., David Henderson & Kevin Winstanley (Bracewell & Leaver). James Stirling, Q.C., and John Syms (Gordon Dadds & Co.).

E. JONES
Barrister-at-Law.

Parliament

Disabled Persons (Employment) Bill

ON March 31 Mr. ROBERT CARR, parliamentary secretary to the Ministry of Labour and National Service, in moving the second reading of this Bill, said that its purpose was to implement the few recommendations of the Piercy Committee on the rehabilitation, training, and resettlement of the disabled [3] which required legislation. It was a small Bill because the committee had come to the conclusion that the statutory framework of the services was basically satisfactory and had centred their recommendations on how the services could be more effectively used. The main provisions of the Bill are as follows:

The minimum age for attendance at vocational training courses and industrial rehabilitation courses is reduced from 16 to the school-leaving age. Courses will thus be available for boys and girls immediately on leaving school, and the present gap will be avoided.

The minimum period of disability before a person becomes eligible for registration is increased from 6 months to 1 year.

The powers and duties of the local authorities for the employment and training of the disabled are transferred from the jurisdiction of the Health Ministers to the Minister of Labour. The local authorities' responsibility for welfare and aftercare will remain under the jurisdiction of the Health Ministers as at present.

In the debate Mr. SOMERVILLE HASTINGS said that he was uneasy that these services should drop the pilotage of the Ministry of Health. He appreciated that the change would be administratively convenient, but disability was largely a medical problem and he thought that it would be to the advantage of the disabled if there were always a watching brief on health available to them. In their training, in the selection of occupations for them, and in the supervision of their progress, recovery, and capacity for new work, medical considerations must always come in. He hoped that under the new arrangements this would not be forgotten.

In his closing speech Mr. CARR gave an assurance that the local-authority services would not be covered by the block grant, but would remain direct-grant aided.

QUESTION TIME

Children in Mental Hospitals

Mr. N. N. DODDS asked the Minister of Health what was being done to establish small units throughout the country for giving treatment to children who are acutely ill so as to eliminate the need for placing them in mental hospitals primarily devoted to adults, and sending them so far away as to deprive them of visits by relatives and friends.—Mr. DEREK WALKER-SMITH replied: There are 17 special units for mentally ill children in England and Wales. 10 of these are administered in association with a mental or neurosis hospital; all these are in buildings separate from those used for adult patients. 9 other units are planned or under consideration. Because the number of children who suffer from mental illness (as distinct from mental defect) is fortunately comparatively small, admission to a special unit may involve sending them farther from home than would admission to the mental hospital serving the area in which they live.

Mr. DODDS asked the Minister what consideration had been given to ending the detention of children at Rampton Mental Hospital.—Mr. WALKER-SMITH replied: Alternative arrangements are not available for these children who are of dangerous or violent propensities. They are transferred to other care as soon as this is warranted by improvement in their condition.

Review of Mental-defective Patients

Mr. DODDS asked the Minister what progress had been made in reviewing the cases of mental-defective patients with a view to ending compulsory powers, consequent upon the instructions issued on Jan. 16.—Mr. WALKER-SMITH replied: At March 25 hospitals had submitted 9122 recommendations and of these 5155 patients have been discharged from orders to remain in hospitals on an informal basis.

Merit Awards

Mr. KENNETH ROBINSON asked the Minister of Health the total numbers of consultant physicians, surgeons, and psychiatrists in England and Wales; and what was the number of merit awards in each of the three categories, showing A, B and C awards separately.

Mr. WALKER-SMITH replied: On Dec. 31, 1957, the figures were as follows:

Specialty	Number of consultants	Awards			
		A	B	C	Total
General medicine ..	822	59	151	263	473
Mental health	614	6	20	63	89
General surgery ..	863	62	138	256	456

NOTE: If a consultant practises in more than one specialty, he has been included in each.

Poliomyelitis Vaccine

Mr. S. S. AWBERY asked the Minister if the supply of poliomyelitis vaccine and Salk vaccine was now sufficient to meet British requirements; what proportion of schoolchildren had so far been inoculated; and when he expected 100% to be inoculated.—Mr. WALKER-SMITH replied: Purchases of poliomyelitis vaccine, including Salk, are being kept under constant review in the light of the number of registrations for vaccination. Separate figures for schoolchildren are not available, but at the end of February 37% of all the children in Great Britain who had been registered had had two injections and a further 11% their first injection. It is the Government's aim that vaccination should be available by the summer for those in the priority groups who have registered.

Mr. R. S. RUSSELL asked the Minister if he would arrange for local authorities which had more anti-poliomyelitis vaccine than they needed at the moment to transfer some to those which did not possess enough for their immediate needs.—Mr. WALKER-SMITH replied: While no authority has more vaccine than is needed to vaccinate its registered children, I am aware that some authorities which at present have vaccine in hand are giving others temporary assistance by mutual arrangement, and I am encouraging this. Of the total quantity of vaccine issued to date 62% has been of British manufacture.

Cost of Antibiotics

Mr. A. M. SKEFFINGTON asked the Minister why the one firm supplying specialised antibiotics was not subject to cost

1. 11th ed.; vol. 2, p. 34.
2. (No. 1) (1939). Pp. 228, 234. See *Lancet*, 1939, i, 593.
3. See *Lancet*, 1956, ii, 986.

investigation.—Mr. WALKER-SMITH replied: Some 15 firms supply specialised antibiotics to the National Health Service; and, of these, 2 firms are each the sole supplier of one particular drug. For the supply of these two drugs to hospitals the Ministry of Health negotiates running contracts, which do not provide for cost investigation because the firms have so far been unwilling to accept a costing clause and I have no power to compel its inclusion.

Regional Hospital Expenditure

Mr. R. L. MAWBY asked the Minister whether he would indicate in a table, for the financial years 1952–53 to 1957–58, the expenditure, actual or estimated, for capital and for all other items together respectively, of the hospital authorities per head of the estimated population for each hospital region of England and Wales, including therein the expenditure of boards of governors as well as those of regional hospital boards.—Mr. WALKER-SMITH: The following table sets out the information:

Region	Capital expenditure per head of population											
	1952–53		1953–54		1954–55		1955–56		1956–57		1957–58 (estimate)	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Newcastle	4	8	4	1	8	1	5	9	7	5	10	7
Leeds	4	0	3	10	4	4	4	4	5	4	7	2
Sheffield	3	1	3	6	4	5	5	7	6	8	7	8
East Anglian	4	10	4	5	5	2	5	4	5	10	6	8
N.W. Metropolitan	5	5	5	0	5	11	5	10	6	4	7	10
N.E. Metropolitan	4	3	2	10	3	9	3	5	4	8	6	11
S.E. Metropolitan	4	0	3	10	4	6	4	3	7	1	8	3
S.W. Metropolitan	4	9	4	10	5	9	6	4	7	2	7	9
Oxford	4	2	4	4	8	0	8	0	9	9	14	5
South Western	3	9	3	6	5	11	4	11	6	4	8	7
Welsh	5	2	6	1	7	5	6	8	7	10	10	4
Birmingham	3	3	3	4	3	7	3	10	4	11	6	10
Manchester	3	9	3	3	3	3	4	3	4	8	6	3
Liverpool	3	9	3	5	5	0	6	0	8	7	11	0

Region	Revenue expenditure per head of population											
	1952–53		1953–54		1954–55		1955–56		1956–57		1957–58 (estimate)	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Newcastle	4	9 10	4	17 2	5	0 7	5	9 9	6	0 8	6	10 3
Leeds	4	19 0	5	2 7	5	8 5	5	17 8	6	9 5	6	19 5
Sheffield	4	1 7	4	5 5	4	10 0	4	18 2	5	7 10	5	15 4
East Anglian	4	4 9	4	9 0	4	13 7	5	3 0	5	12 9	6	0 5
N.W. Metropolitan	7	7 0	7	12 1	7	17 2	8	9 4	9	1 7	9	12 7
N.E. Metropolitan	6	16 11	7	4 4	7	8 2	8	0 2	8	12 10	9	2 1
S.E. Metropolitan	7	0 3	7	4 8	7	10 5	8	1 11	8	14 8	9	5 8
S.W. Metropolitan	7	4 4	7	10 5	7	15 2	8	9 1	9	2 11	9	14 2
Oxford	5	11 0	5	17 0	5	19 8	6	9 6	6	18 10	7	5 7
South Western	5	15 9	6	1 8	6	5 5	6	17 4	7	9 0	7	17 10
Welsh	4	17 6	5	5 7	5	11 4	6	1 7	6	14 8	7	3 11
Birmingham	4	11 4	4	15 3	4	19 11	5	7 10	5	17 0	6	4 5
Manchester	4	12 0	4	17 1	5	0 9	5	10 5	6	1 6	6	9 2
Liverpool	5	12 5	5	18 6	6	4 4	6	14 11	7	6 3	7	16 6

In some regions more than in others revenue expenditure is increased by the provision of services, at teaching or non-teaching hospitals, for patients from other regions. No estimate is, however, available of the effect of this upon the figures.

National Health Insurance Contributions

Mr. FRED BLACKBURN asked the Chancellor of the Exchequer by how much the weekly contributions for National Insurance and Health could be reduced if such contributions ceased to rank for tax relief.—Mr. D. HEATHCOAT AMORY replied: By about a shilling in the case of a male employee over 18, on the assumption that the extra revenue was devoted to the National Insurance Fund.

Nursing at Mental Hospitals

The rate of recruitment of nursing staff to mental and mental-deficiency hospitals has improved in the last two years with an increase in the number of both men and women students. The figures are as follows:

—	1955	1957	Increase
(a) *Total nursing staff:*			
Whole-time	26,713	28,443	+1730 (6%)
Part-time	9130	9953	+ 823 (9%)
(b) *Student nurses (included in (a)):*			
Whole-time—Male	1708	2426	+ 718 (42%)
" Female	2518	3277	+ 759 (30%)

In England Now

A Running Commentary by Peripatetic Correspondents

I SUPPOSE histories are a good thing. I recall Sir Luke telling us when we were boys: "Pay attention to the anamnesis, gentlemen, and the rest follows as the night the day." To him (and also to all neurologists I have since met) the physical signs could be made to support any diagnosis the history had suggested. Perhaps it was this fact that decided me, in later life, not to pay too much attention to the patient's utterances, which are, after all, subjective, highly coloured, and possibly implanted by his wife, the neighbours, or his study of the Sunday newspapers. To me the honest physical sign was everything; I spent long hours seeing if the patient knew which way I was moving his toes (holding only the lateral aspects, of course). I decided that a good laboratory test was worth an hour of talk and I always had an excuse for the lab. if they baulked at doing the ketosteroids just *once* more. The genetic mutations that must have resulted from my X rays now appal me.

But as old age creeps on and the chromium plate is quite worn from the margins of my stethoscope, I must confess to a certain lethargy—a disinclination to budge from the comfort of the armchair. "Tell me all about it," I say and fill my pipe. I feel disgruntled when obliged to lay stethoscope on chest: "No need to take all that lot off, old chap," I say, listening through his waistcoat. Very reprehensible, I know, but I reckon I'll live longer, though I suppose there's a chance my patients won't. Still, I do think I used to overdo the examining side of things in the old days. It heartens me to see these studies of observer error: makes me remember all sorts of times when different physicians heard different murmurs in the same patient: after all if radiologists differ on shadows why shouldn't the stethoscope lead to dispute? When Sir Luke said: "A diastolic murmur, boy, can't you hear it?"—he may have heard one, but that doesn't mean it was actually there.

The final vindication of my new outlook came from a couple of cases I heard of recently. The first was a young lady who had been through the mill at some fertility clinic to the extent of having air pushed around (with normal results). Some time afterwards a psychiatrist suggested that her sterility was probably due to the fact that she had not had sexual relations for some years. The other one was a young man with exceptionally large masseters diagnosed as an atypical variant of pseudohypertrophic muscular dystrophy. Long were the conferences and a muscle-biopsy was done but was normal. Legend has it that the new H.P. asked the chap: "What do you do when you're worried?" "I clench my teeth very tight, Doctor," he said. Yes, I think Sir Luke was right all the time.

• • •

The peripatetic discovery (March 29) of a single pedal, in a good state of preservation, lying on a public highway has excited the interest of bicycle historians everywhere. As I see it, the circumstances point to the pedal having become detached from the machine at a moment when the rider's foot was not in contact with it. Otherwise he could hardly have disregarded its loss.

It therefore becomes of vital interest to know the gradient of the road at the site of the find. For if the pedal was lying, as one must hope it was, half-way down a good long hill, its presence there could be regarded as presumptive evidence of the survival of at least one member of a species of cyclist which all the most recent authorities have presumed to be extinct in this country, though occasional specimens were still to be found earlier in the century—mainly, for some unexplained reason, among country clergy. I refer, of course, to that type of rider who, scorning (or perhaps distrusting) the new-fangled "free-wheel", was forced while coasting downhill to disengage his feet from the pedals and rest them temporarily on brackets attached for the purpose to the front fork. The loss of a pedal unbeknown to the rider at such a time is readily attributable to the exhilaration produced by the downward rush, while even if he were conscious of it, his failure to stop

and retrieve the component so vital to his progress beyond the foot of the hill may be explained by the fact that a fixed wheel was, in this species, usually associated with rudimentary brakes, if not with their total absence.

If, on the other hand, the find was made on a level stretch, one is forced back on a more prosaic explanation. Tuberculosis of the knee-joint in early life had left the cyclist with one stiff leg, forcing him to rely for propulsion on the unaided efforts of the other. When, therefore, the unused pedal fell off one day, its loss left him unmoved. As a matter of fact the thing was always getting in the way of his lame leg and he had been meaning for months to take it off anyway, only he could never find that damned spanner . . .

* * *

Rural sanitation is full of surprises; the conditions in and around shallow wells, for example. I was inspecting drainage and water arrangements at a country house last week and noticed that the shallow well which was the sole supply of drinking-water had a well cover raised about 2 ft. above ground level on top of a concrete wall, and that the ground for some distance around was adequately concreted, thus excluding surface contamination of the well. The well cover was unusually high, but nevertheless I congratulated the house-owner on his initiative and hygienic standards, only to be told that the work had been done by the previous owner of the house, not in the interests of hygiene, but to provide himself with a mounting-block!

* * *

The Mandarin's sudden appearance for a consultation was an unusual event in our Thames Valley backwater. His card bore a West-end address and " late of Peking " with, I presume, his name and " Sweet Flowering Twig " in brackets for the benefit of those ignorant of Pekinese, or more probably High Manchu. His high-pitched voice told me he was seventy-eight and that his name was McConachie. He could easily have been ninety.

A glance at his face, like dried-out putty, his pin-point pupils, his emaciation, and I saw his whole case-history in a flash. Unable to obtain heroin, cocaine, and the like in his own milieu, he was travelling afield in his remarkably fine Bentley (with an even more remarkable blonde) pleading intractable sciatica—a shot of pethidine plus script for two dozen ampoules would tide him over the weekend party at Henley. I saw him in his red and gold bedragoned robes, long mustachios adroop, moist napkins pressed to his brow, the gold nail-shields removed to scoop more easily his winnings at Fan Tan (does anyone play Mah Jong?), twitching his ivory fan, whilst the bead curtains silently parted to disclose the youngest tea concubine. I saw his short pigtail by which the spirits would whisk him to transports of celestial delight when mortal span had ceased; and, brooding over all, the inscrutable East—the Winter Palace, the Last Empress, Somerset Maugham, and Fatalism . . .

But there he was, alive and kicking off his sandals. Emanating a faint whiff of burning joss-stick, with hands clasped and hidden in his sleeves, he bowed low and slow from the waist, and—Confucius bless him—paid me half-a-guinea for my diagnosis, prescription, and prognosis of his athlete's foot.

* * *

I rang the boy on the office phone. The typist answered.

" Is Jackson there? "

" I'll send him in." And before I could say more, she had put down the phone.

A moment later Jackson appeared.

" I didn't mean her to send you in," I started apologetically. " I just wanted you on the phone." But Jackson had disappeared. A moment later the phone rang.

" Jackson here."

* * *

A bright young thing in whom a possible diagnosis of glandular fever had been raised—and the necessary investigations ordered—asked with a blush on the next ward round whether her Beau Brummell was positive.

Letters to the Editor

PRE-ECLAMPTIC TOXÆMIA

SIR,—In his ingenious explanation of the ætiology of pregnancy toxæmia, Professor Platt (March 15) invokes an antigen-antibody reaction between fœtus and mother —" the condition being akin to rhesus incompatibility in reverse ".

The kidney has been shown to be involved in antigen-antibody reactions.

Pressman [1] has confirmed earlier findings that all available types of antisera are capable of nephrotoxic action. After the injection of antistreptococcal serum impregnated with radioactive iodine, radioactivity was found only in the glomerulus, none being transported into the tubule. This evidence of ischæmic spasm of the renal cortex is supported by Hartman's [2] demonstration that injection of an anti-cortex serum, which he attributes to spasm of the renal afferent arteries, reduces the number of glomeruli in the kidney—a happening that may explain the ultimate anuria consequent on renal homotransplants. There is also much evidence that renal cortical ischæmic states can account for " toxæmic " manifestations.[3]

I believe, however, that Professor Platt's hypothesis is untenable for several reasons. It does not explain (1) why toxæmia is pre-eminently a disease of the primigravid, (2) how it can occur post partum, or (3) why it should sometimes recur at labour, days after subsiding on the death of the fœtus. Furthermore there are two possible sources of error in the compilation of the statistics—first the insistence on the eventual presence of albuminuria for the diagnosis of toxæmia, and secondly an implied acceptance of the equal accuracy of diagnosis in the two generations—an equality disturbed by medical awareness of the condition and the greater facilities for antenatal supervision in the younger.

By their findings, Professor Platt and his colleagues exclude the possibility that only one gene is responsible for pre-eclampsia; but they still think that several different genes may be capable of causing the disease. There is recent proof, however, that this cannot be so.

The failure of renal homotransplants to take seems to be based on a specific immunological reaction. Such a reaction is absent in identical twins; for renal homotransplantation has been effected in three sets of identical twins (Merrill [4]). In the light of this, a case-report just published by Brown [5] needs scrutiny.

It concerns a first pregnancy, with identical twins, which was entirely normal up to the 20th week. From then until the 24th week the patient had acute hydramnios and " imminent " eclampsia. Rational treatment by amniotomy overcame the excessive uterine stretch, and the signs of toxæmia subsided. The hydramnios did not recur and the pregnancy continued for a further 16 weeks perfectly normally. At birth one twin was in a papyraceous state: its length of 15 cm. indicated that it had perished much before the 24th week. The structure of the placenta and the single sac showed that the twins were identical.

If there had been any particular genes in the fœtus papyraceus responsible for the pre-eclampsia, the same genes, in the surviving twin, would have perpetuated the toxæmic process. The disappearance of the toxæmia excludes a genetic intrusion into the ætiology.

This case is, I believe, sufficient to refute Professor Platt's thesis—unless perhaps he argues that his hypo-

1. Pressman, D. Fifth Annual Conference on Nephrotic Syndrome. Philadelphia, 1953.
2. Hartman, M. E. *Arch. Path.* 1957, **64**, 679.
3. Sophian, J. *Excerpta med.* 1958, **11**, sect. x, 1.
4. Merrill, J. P. Address to the Renal Association. London, 1957.
5. Brown, G. R. *J. Obstet. Gynæc. Brit. Emp.* 1958, **65**, 61.

thetical factor, which may protect the mother after her first toxæmic pregnancy, can develop on the intrauterine death of one twin.

London, W.1. JOHN SOPHIAN.

SIR,—My interest in the paper by Professor Platt and his colleagues prompts me to ask whether they would be kind enough to furnish the following further particulars:

(1) How many of the women graduates or wives of graduates had had their blood-pressure taken before pregnancy?

(2) At what stage of pregnancy the hypertension, the hypertension + proteinuria (H+P) or the hypertension + œdema (H+O) developed?

(3) Whether the 8 women who had toxæmia in their second pregnancy had it in their first, and

(4) The perinatal mortality associated with the "pre-eclamptic toxæmia"?

It is indeed strange that at a time when well-conducted antenatal clinics are able virtually to abolish eclampsia the term pre-eclampsia should remain so fashionable. Apart from causing maternal death or damage, or fœtal death or damage, "pre-eclampsia" possesses a merely academic interest. Leaving hypotheses aside we have found at Bradford that the perinatal mortality associated with hypertension, whether essential or occurring during pregnancy (about 2500 cases) was between 5% and 6%; with H+O the same; with H+P, 20%; and with eclampsia approximately 50%. Further, our figures show conclusively that the earlier the onset of H+P during pregnancy the more likely will be the mother to have either hypertension or H+O or H+P in subsequent pregnancies. A woman who develops acute eclampsia during the 39th or 40th week of pregnancy will most likely remain normal throughout subsequent pregnancies, whereas a woman who develops H+P at or about the 34th week of pregnancy in two successive pregnancies, notwithstanding adequate antenatal care, is incapable of a normal pregnancy apart from denervation of her internal iliac vessels or some form of sympathectomy. It is, therefore, essential to differentiate these types of cases and not lump them under the meaningless term of pre-eclampsia.

I heartily agree with Professor Fekete (March 22) when he stresses dysharmonious function of the various hormones rather than the overactivity of one as the cause of "pre-eclampsia", and that hypertension and H+P occur not infrequently for the first time during the puerperium.[1]

I have postulated that the "pregnancy toxæmias" are due to malnutrition and mechanical factors. The malnutrition may be due to an inadequate or unbalanced maternal diet (but not to deficiency of vitamin B_1), or to an inadequate blood-supply to the placenta. This latter inadequacy may be due to local or generalised arterial spasm or to hypoplasia of the arterial tree, and is for the most part associated with maternal defects which preceded the pregnancy. So far as I can see this hypothesis alone explains the geographical distribution of eclampsia, the variation in its incidence caused by war, and the fact that whereas the incidence of hypertension during pregnancy is unaffected by antenatal care, that of H+P and toxæmic accidental hæmorrhage can be greatly reduced and eclampsia can be eliminated.

Finally may I be allowed to make one observation on Professor Browne's delightful letter concerning post-maturity (March 1)? The importance of this problem cannot be gauged by studying hospital reports, for its significance may vary from country to country and from city to city. Who would have believed it possible that the incidence of anencephalus in "Belfast and Dublin was approximately three times greater than in Birmingham, ten times greater than in Malmö and Lund, and fifty times greater than in Lyons"?[2] During 1947 we induced labour because of postmaturity in 334 patients and all the mothers and all the babies went home alive, the credit belonging to the registrars and nursing staff.

Bradford. G. W THEOBALD.

SIR,—Both Professor Browne (Jan. 18) and Professor Fekete (March 22) appear to accept the view that there is hyperfunction of the adrenal cortex in normal pregnancy, although Professor Fekete does not believe that this organ plays a major part in the ætiology of pre-eclampsia. While the raised levels of plasma-cortisol during gestation[3] and some of the clinical features suggest that in normal pregnancy the adrenal glands are hyperfunctional, recent evidence does not support this view.

Migeon[4] and his colleagues, by demonstrating that the half-life in the plasma of administered radioactive cortisol is prolonged in normal pregnant women, have shown that the rise in plasma-cortisol may be due to delayed inactivation or utilisation. In keeping with this hypothesis Appleby and Norymberski[5] have provided evidence that the excretion of 17-hydroxycorticosteroids in the urine of normal pregnant women does not increase greatly during gestation. A study in this laboratory, as yet unpublished, of the excretion of the unconjugated cortisol and cortisone in the urine shows a similar moderate rise in pregnant women; although there was relatively no change in the conjugated steroids measured. Moreover, little, if any, alteration in weight of the adrenal gland occurs during pregnancy in the human female, and the histological picture does not resemble that of prolonged stimulation by corticotrophin (A.C.T.H.).[6] Hyperfunction of the adrenal cortex is associated with excessive catabolism of the body proteins,[7] but in normal pregnancy with adequate nutrition considerable retention of nitrogen, potassium, and phosphate occurs and there is also evidence of an increase in the maternal cell mass.[8–10] Thus isotopic, morphological, metabolic, and hormone-excretion studies provide no evidence to support the view that pregnancy is associated with hypersecretion of the important glucocorticoid, cortisol.

Though it is possible that the inactivation or utilisation of aldosterone may alter in a way similar to cortisol there is as yet no evidence for this. Our view that the increased amounts of aldosterone-conjugate present in the urine of pregnant women[11,12] is a reflection of a homeostatic response to an increased need for sodium conservation by the kidneys[13] is based on the assumption that the rate of aldosterone excretion in the urine is indeed related to its production by the adrenal cortex. The low values obtained in pre-eclamptic toxæmia may be due to an inhibitory effect of the enlarged extracellular volume.

Department of Chemical Pathology, King's College Hospital Medical School, London, S.E.5. C. H. GRAY M. G. RINSLER.

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2. *Brit. med. J.* March 22, 1958, p. 695.
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13. Rinsler, M. G., Rigby, B. *ibid.* 1957, ii, 966.

SIR,—I too believe that the symptoms of toxæmia of pregnancy are caused by a spasmodic liberation of hormones from a hyperfunctioning adrenal gland.

It is well known that vitamins have a synergistic action—not only the various hormones of the vitamin-B complex but also the vitamins A and C. Thus, a patient taking a diet deficient in nicotinic acid may get pellagra because he is getting far too little aneurine.

The reason may be that symptoms of the avitaminoses may be caused not merely by lack of vitamins but also by some organ of internal secretion. Wenckebach [1] believed that in beriberi, and presumably in scurvy and rickets, there is probably a pituitary deficiency. In cases of acute heart-failure, which may affect patients with beriberi, Wenckebach injected vasopressin (1 ml.), which was often followed by immediate but only temporary recovery; during the respite the patients were given injections of aneurine. When they lost their dropsy, they were for a long time liable to a relapse—e.g., when they added more salt to their diet.

In dry beriberi, general dropsy develops if the patient takes too much salt.[2 3] One wonders about the secretion of aldosterone in these cases, and about the effect of cortisone or corticotrophin in very serious acute cases, for 1 ml. of vasopressin contains some corticotrophin. Under the same living conditions, men get beriberi more easily than women, but in pregnancy this phenomenon is reversed. There are areas where nearly every woman who becomes pregnant gets beriberi, and among these a great many become toxæmic.

Not only pregnancy but also vitamin deficiency lays a stress on the adrenals of the mother. In my opinion it is very probable that where pellagra is endemic the same double stress is put on the adrenals because some vitamins of the B complex fail in synergistic action.

The avitaminoses show clearly the relations between diet and toxæmia on the one hand, and between these two and the adrenal glands on the other.

Amsterdam. R. SCHUURMANS.

SIR,—More salt or less salt in toxæmia?

Why has there been no correspondence about Dr. Margaret Robinson's paper of Jan. 25, entitled Salt in Pregnancy? Perhaps the endocrinologists dismissed it because toxæmia was left out of the title, but what of the obstetricians?

Dr. Robinson concludes uncompromisingly: "Extra salt in the diet seems to be essential for the health of a pregnant woman, her fœtus, and the placenta."

She claims that there was less toxæmia and œdema among 1039 pregnant women told to take extra salt daily than among 1038 advised to take less, and adds that all of 20 women with *early* toxæmia (but some of them *late* in pregnancy) were kept well by adding three or four heaped teaspoons of table salt to the daily diet; but 3 patients did not regularly consume all the salt prescribed, their blood-pressure did not fall to consistently normal levels, and they were the only ones to show any placental infarction.

This would suggest that NaCl deficiency had led to just that placental ischæmia which Professor Browne (Jan. 18) regards as underlying eclampsia. The control of early cases of toxæmia by progesterone [4] might then be connected with the concentration of available NaCl. But does NaCl deficiency have these effects?

If Dr. Robinson's conclusions are reliable, they are of immediate practical value, but if unreliable, potentially dangerous. They should be verified or challenged without delay, for meanwhile in many antenatal clinics, patients with headaches, hyperpiesis, or œdema are being asked to reduce their salt intake. Rightly or wrongly?

Public Health Laboratory, London, N.9. MAIR E. M. THOMAS.

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TUBERCULOSIS CASE-FINDING BY MASS RADIOGRAPHY

SIR,—I should like to make one or two corrections of historical importance in the otherwise excellent article by Dr. McDowell (March 22).

In April, 1944, the City of Nottingham mass-radiography unit started selective radiography and has energetically continued with that policy up to the present date, although it was against the official policy of the Ministry of Health. It was felt best "to fish in the most plentifully stocked waters". This unit in 1944 was the first in the British Isles to provide a regular service for the X-ray examination of general practitioners' cases and also for "public or open sessions". This policy therefore anticipated the decision of the Regional Advisory Committee on Tuberculosis Services of the Birmingham Regional Hospital Board area by some 7 years and that of the Ministry of Health by some $13^1/_2$ years.

In an article [1] which I wrote in June, 1949, I showed that during 1948 the public sessions produced 10 active cases of pulmonary tuberculosis per 1000 persons X-rayed, and the general practitioners sessions 34 cases per 1000 X-rayed, and thus clearly demonstrated the importance of X-raying these two groups.

In 1949–50 I persuaded Dr. Halliday Sutherland, then medical director of the Birmingham unit, to start a service for general practitioners' patients and this proved to be most successful; and about the same time a central unit in Liverpool embarked on a similar service.

It was the results of the pioneer work done by the City of Nottingham unit, confirmed years later by the results of both the Birmingham and Liverpool units, that caused a reversal of the Ministry of Health's policy in November, 1957, when a policy in favour of static units and selective radiography was advised wherever it was possible, and this Ministry circular[2] emphasises that general-practitioner sessions and open or public sessions are the most rewarding from the case-finding point of view.

Dr. McDowell states that "his article will present nothing new". That does not matter, but what is important is that the details contained in it clearly substantiate the principles which have actually been practised by the Nottingham unit for the past 15 years—i.e., selective radiography, static centres, and for the future a number of cheap but efficient light-weight satellite units to operate in the area surrounding the static centres.

I hope that the units of the Birmingham region are not becoming "one-track minded" and concentrating only on tuberculosis to the exclusion of other important diseases—i.e., bronchiectasis, congenital hearts, and, indeed, carcinoma of the lung. There is no reason why this work should not be carried on at the same time as the search for tuberculosis, as has been done in the past 14 or 15 years with the Nottingham unit. As the incidence of tuberculosis declines in the years ahead the objective of the M.M.R. units will be concentrated on the search for the early cases of lung cancer, the incidence of which is steadily increasing from year to year. The earlier the diagnosis is made the better will be the results of resection of the lung for this condition. I venture to suggest therefore that in the years ahead the M.M.R. units will have to concentrate on X-raying as large a number of men as

1. Beynon, A. E. *Med. Pr.* 1949, **221**.
2. H.M. (57) 94.

possible in the 35-and-over age-group, perhaps twice a year, with this in mind.

During the period 1944–56 the City of Nottingham unit discovered 445 (males 365, females 80) confirmed cases of bronchial carcinoma. In the year 1955 35 males (4·6) and 6 females (0·8) making a total of 41 cases were confirmed, and in 1956 51 males (7·2) and 8 females (1·1) making a total of 59 cases (the figures in parentheses show the incidence-rate per 1000 X-rayed aged 35 and over).

It will be seen that not only has the number increased between the 2 years but the actual incidence per 1000 X-rayed has also increased, and I am told not only is the number of cases for 1957 even more but the incidence per 1000 is also higher. I think this will clearly show the important roll of M.M.R. in the search for bronchial carcinoma in the future.

Nottingham. A. E. BEYNON.

LONG-TERM ANTICOAGULANT TREATMENT FOR CORONARY-ARTERY DISEASE

SIR,—The remarks of Professor McMichael (March 8) are more than timely, since failure to use anticoagulant therapy is now held in some circles to constitute almost medical malpractice! While it is my belief based on a limited experience that such therapy is of value and I can find statistical data to support this view, I am unable, however, to overlook the equally good conflicting data. One of the main difficulties of a properly controlled double-blind study is the fact that a medical colleague of the patient's doctor must know the prothrombin-time and is thus aware of whether or not the patient is a control. To exclude any possible bias, it is essential that this colleague nether visits the patient nor discusses the patient's progress with the doctor. I hope this difficulty is being surmounted in the M.R.C. trial.

One statement in Professor McMichael's letter, however, bears correction, for he states that there is no real evidence to show that the coumarin drugs significantly delay intravascular blood-clotting. There is, in fact, as much evidence to indicate that they inhibit clotting in vivo as there is evidence that in hæmophilia the in-vivo clotting is impaired. It is true that the whole-blood clotting-time of patients on coumarin drugs is usually normal, but this is also true of most cases of mild hæmophilia. Furthermore, factor VII is known to be diminished early in anticoagulant therapy, and patients who have a congenital deficiency of factor VII always have normal whole-blood clotting-times and normal prothrombin-consumption and thromboplastin-generation tests; in fact, the only abnormal test is the one-stage prothrombin-time, yet these patients may have severe hæmorrhagic symptoms.

It is quite possible, however, as Professor McMichael indicates, that any beneficial action of the coumarin drugs may be quite unrelated to their anticoagulant action. It seems quite clear, at any rate, that the hæmorrhagic manifestations are not due primarily to hypocoagulability of the blood, although this is an associated feature. Patients under treatment with these drugs who have long prothrombin-times may or may not have hæmorrhagic manifestations. If they do these are spontaneous or purpuric in type and quite different to the lesions found in hæmophilia and in the hæmophilioid states and generally attributed to hypocoagulability of the blood. Secondly, in hæmorrhagic disease of the newborn and in vitamin-K deficiency in adults the lesions are also purpuric. There is no evidence that there is present in normal plasma a factor which can restore the prolonged bleeding-time of patients with von Willebrand's disease to normal. This is a rather surprising finding which I have recently confirmed and it may well be that the coumarin drugs inhibit the production of such a factor.

This is just one of the possibilities that remain to be elucidated and we are far away from a clear understanding of the action of the coumarin drugs.

University of Virginia Hospital, Charlottesville, Virginia. CECIL HOUGIE.

METABOLIC EFFECTS OF BRAIN INJURY

SIR,—Your leading article of March 29 deals with a complex and controversial question.

The nervous control of sodium excretion is being studied by Kovách, Földi, and their associates in Budapest and they have already shown that cerebral hypoxia increases the tubular reabsorption of sodium in the dog.[1,2]

Nevertheless, when you ask how hypernatræmia arises in cerebral disorders, we feel you underestimate the importance of water deficiency. As you point out, when these patients' antidiuretic mechanism is intact the volume of their urine is small and its concentration high. An increased intake of water does reduce the level of their plasma-sodium.[3,4] The magnitude of their extra-renal losses is often not appreciated, and they may have lost the ability to regulate their own intake of water.

A pure water deficiency seldom produces circulatory collapse; it may, however, lead to disorientation[5] and even stupor, which are apt to be attributed to the original cerebral disorder. We have been unable to find any recorded cases with normal neurohypophyseal and renal function in whom the hypernatræmia persisted when enough water had been given to establish a water diuresis. We have concluded[6] that in the majority of cases the hypernatræmia will be corrected with water. In view of the Hungarian work it would be very interesting to know of any that were not.

Medical Unit, Cardiff Royal Infirmary. PAUL FOURMAN, PATRICIA M. LEESON.

THYROID FUNCTION IN PATIENTS WITH MAMMARY CANCER

SIR,—I read with great interest the article by Dr. Edelstyn and his colleagues (March 29). Two of my patients seem to confirm their finding of symptomless depressed thyroid function, but one has no evidence of blood-borne metastases.

CASE 1.—In an obese woman, now aged 45, an enormous carcinoma of breast was discovered in May, 1955, with some involvement of axillary glands. It was treated with deep X rays only. On account of severe pains, due partly to local radiation-necrosis, and slightly increasing size of the breast she was put on thyroid gr. 2 in June, 1956, increased to gr. 4 in July, 1956, with methyltestosterone 50 mg. daily. In May, 1957, radiation-induced menopause stopped her previous regular periods. X-ray check-ups have never shown evidence of secondaries and there is no further local spread. Although on thyroid gr. 4 daily there is no sign of weight-loss or thyrotoxicosis.

CASE 2.—A married woman, now 48, had a small inactive adenoma of thyroid, discovered in June, 1954. In November, 1955, radical mastectomy was performed, followed by postoperative local radiotherapy for stage-3 carcinoma of

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4. Gordon, G. L., Goldner, F. *Amer. J. Med.* 1957, **23**, 543.
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6. Fourman, P., Leeson, P. M. Ciba Foundation Colloquium on Water and Electrolyte Metabolism in relation to Age and Sex. 1958. To be published.

breast. In April, 1957, several secondaries in ileum were treated with local radiotherapy and radiation-induced menopause. In May, 1957, she was put on methyltestosterone 50 mg. and thyroid gr. 2 daily. She was very ill with persisting vomiting and dysphagia till August, 1957, when sudden improvement occurred which has been maintained. The patient is now very fit and back to work. Weight in September, 1957, 10 stone 9 lb.; in March, 1958, 12 stone 3 lb.(!) while still on thyroid gr. 2 and methyltestosterone 50 mg. daily.

Nottingham. G. FIELDING.

POSTOPERATIVE HYPOTENSION

SIR,—It surprises me that in 1958 you can say, in your annotation of March 15, that occasionally the cause of postoperative hypotension "is less obvious, as when oligæmia from unobserved blood-loss during operation leads to" it. Unobserved! "Unheeded" would often be apter. Let the anæsthetist argue with the surgeon during the operation about blood-loss and the desirability of quantitative replacement. He usually, for better or for worse, concludes his responsibility shortly after the patient returns to the ward. Then what may the surgical resident find waiting for him there?

Perhaps not only the "unobserved" 1500 ml. of de Wardener et al.,[1] but, far more often unheeded, the prospect of a postoperative ooze of another litre or so occurring during the next 24 or 48 hours.

Donating blood, I may lose 540 ml. without turning a hair or constricting a skin vessel. But then I haven't had an anæsthetic nor have I a wound to heal nor an infection to prevent. And not a drop more will leave the circulation. This often-quoted analogy is an irrelevant one.

Letheringsett, Norfolk. J. N. COZENS-HARDY.

SMOKING AND RESTLESS YOUNG MEN

SIR,—The far-fetched hypothesis that tobacco-smoking and lung cancer have partly a common cause in a constitutional factor is, as your annotation of March 29 points out, very difficult to accept. Even if it was acceptable it would hardly affect the case against tobacco, but it and similar theories will continue to fog the issue so long as tobacco has defenders or until the cancer-smoking causal relationship is completely elucidated, or its existence proved beyond all possible argument by controlled experiment.

In your same issue (p. 657) Dr. Doll and his colleagues report a controlled experiment proving that smoking, continued during treatment, delays the healing of peptic ulcers. Surely experiments such as this should also be made to discover more completely many of the other relationships of smoking to health? In many cases the facts are in doubt, and as far as cancer is concerned the last refuge of the obscurantist and wishful thinker would be destroyed. The national resources available for anti-tobacco education are necessarily limited, and there is therefore a sound ethical case for constituting some of the first beneficiaries of it into an experimental group. This has been done with poliomyelitis vaccine and fluoridated water-supplies, in the latter case more to demonstrate the facts than to discover them. Schools and places of employment, as well as residential areas, might determine the grouping, and a scientific study of motivation and of different techniques of education and persuasion might also be included in the experiment.

London, S.W.10. R. B. D. STOCKER.

1. *Clin. Sci.* 1953, **12**, 175.

MORTALITY OF SEVERE HEAD INJURIES

SIR,—After reading the excellent article by Mr. Maciver and his colleagues (Feb. 22), I wish to draw attention to the dramatic response in patients with head injury to thiopentone cautiously given intravenously in dilute solution, after the initial shock has been combated.[1] The patients improved greatly, in that hyperpyrexia and high blood-pressure were lowered and bronchial secretion and restlessness reduced.

We feel that thiopentone has some coordinating action on the reticular activating system[2] and that the "lytic cocktail" is in some ways dangerous, by increasing the effects of anoxæmia in the tissues, particularly the brain.

Amsterdam. T. WILHELMUS.

SEPARATION OF MOTHER AND CHILD

SIR,—I have long supported the "separation anxiety" thesis, even before it was as fashionable as it has become today. It figured very largely in the psychopathology developed and taught by Hadfield,[3] Suttie,[4] and others at the pre-war Tavistock Clinic. Their views were amply confirmed in the child-guidance clinic, and one had no need to devise any special theory, or elaborate statistical evidence, to appreciate to its full extent the protective role of the mother in creating the requisite emotional security for the young child's upbringing. It was a natural corollary to pay attention therefore to anything disturbing the mother-child relationship, whether from within or from without.

Separation of a child from its mother-figure undoubtedly *can* be traumatic, and an estrangement even more so. But this is a far cry from Dr. Bowlby's thesis (March 1) which has laid so much at the door of the *physical* separation of mother and child. Dr. Howells (March 29) rightly maintains that: "Separation and privation are not synonymous terms"; separation can and does occur without privation, as well as vice versa.

Statistical investigations on the subject are valuable in their way; but, to repeat a platitude, one must ask for caution in their interpretation. I still think that our prime need is for more and careful clinical studies of the *total* situation where mother and child have to be separated. With regard to hospital separations it is many years now since I asked[5] for further inquiry into: what kind of children are adversely affected? how far? and in what way?—including of course a study of the reverse process of recovery in those overcoming the "trauma" of separation.

Exaggeration has provoked the inevitable reaction, and I was amused to read of Margaret Mead's outburst[6] calling the thesis "a new and subtle form of antifeminism in which men—under the guise of exalting the importance of maternity—are tying women more tightly to their children than has been thought necessary since the invention of bottle feeding and baby carriages".

One hazard which it seems we have not escaped is the premature dissemination to the public at large of opinions which as yet are not fully authenticated. A recent pamphlet put out by the National Association for Mental Health[7] presents the problem moderately enough, but is sufficiently loaded to cause undue anxiety to already anxious mothers. This April sees the centenary of the birth of Truby King, who in his turn tried to impose a rigid pattern of infant-feeding on the mothers of his day, which is now generally regarded as outmoded.

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2. French, J. D., Verzeano, M. D., Magoun, H. W. *Arch. Neurol. Psychiat., Chicago*, 1953, **69**, 505.
3. Hadfield, J. A. Psychology and Mental Health. London, 1950.
4. Suttie, I. D. Origins of Love and Hate. London, 1935.
5. Edelston, H. *Genet. Psychol. Monog.* 1943, **28**, 3.
6. Quoted by Carstairs, G. M. *J. ment. Sci.* 1958, **104**, 70.
7. Bowlby, J. Can I Leave my Baby? 1958.

Perhaps the crux of the matter lies in the discovery of the "great heterogeneity of personality organisation" which defies classification and asks for a patient and sympathetic understanding of each situation in its own right. Finally I would call attention to the serious danger of using pathological reactions as a basis on which to erect standards of behaviour for normal people; in so doing are we not putting a premium on the element of adventure in really healthy living?

Bradford H. EDELSTON.

UNUSUAL URINE PROTEIN IN MYELOMATOSIS

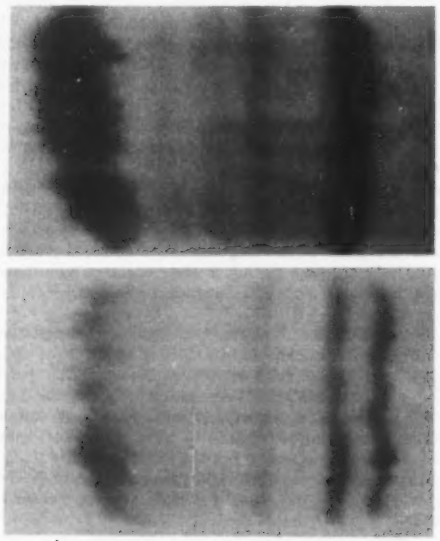
SIR,—The new technique of electron microscopy has helped towards the understanding of the physical principle of glomerular ultrafiltration. Glomerular capillary walls of kidney are structurally specialised, with channels and spaces somewhat similar to those of collodion membranes prepared for use as an ultrafilter.[1]

In our experiments, by ultrafiltration of normal and pathological sera through collodion membranes of suitable porosity, ultrafiltrates were obtained, the patterns of which corresponded to the patterns of pathological urine proteins.[2 3] The concentrated ultrafiltrates of sera were investigated by paper electrophoresis.

We also examined serum ultrafiltrates from patients with myelomatosis and macroglobulinæmia. In each case, electrophoresis revealed an additional electrophoretically homogeneous serum-protein fraction. Even here we were able to find a similarity between natural and artificial ultrafiltrates.

In one patient with myelomatosis we saw an interesting phenomenon.[4] The simple paraproteinæmic serum fraction split, after filtration through membrane of a known porosity, into two clearly separated components, during analysis of ultrafiltrate proteins by paper electrophoresis (see figure). The splitting of this fraction we took to be a result of a change in the electrical charge on colloidal molecules caused by mutual action of membrane pores and protein particles during the filtration process.

1. Hall, V. *Amer. Heart J.* 1957, **54**, 1.
2. Wiedermann, D., Šmarda, J. *Schweiz. med. Wschr.* 1956, **86**, 930.
3. Wiedermann, D., Šmarda, J. *Physiol. Bohemoslov.* 1957, **6**, 232.
4. Wiedermann, D., Šmarda, J., Wiedermann, B. *Z. exp. Med.* 1957, **129**, 286.



Above: Electrophoretic protein pattern of serum from a patient with myelomatosis shows a single γ-globulin fraction; below: Electrophoretic pattern of concentrated ultrafiltrate of the same serum shows two γ-globulin components. Both electrophoretograms were done under the same conditions.

As the discussion in your correspondence columns shows,[5–7] a similar phenomenon was sometimes seen in the sieving effect of the biological glomerular membrane on the blood-proteins passing into the urine. In this connection the idea of an analogy between the glomerular membrane and the artificial collodion membrane may be useful.

Department of Experimental Pathology, Masaryk University, Brno, Czechoslovakia. D. WIEDERMANN.

INSTITUTIONAL CARE OF THE MENTALLY ILL

SIR,—In the article by Dr. Garratt and his colleagues (March 29) there is one point which I do not think should go unchallenged. Under the heading of "supervision" they say that there "could be no reasonable objection" to the employment of general-trained nurses to attend to some of the less disturbed psychiatric patients.

When this survey was being made, the psychiatrists were asked to designate patients who needed no (or minimal) psychiatric nursing supervision. But this does not mean that general-trained nurses would be acceptable.

What such patients require emotionally is the kind of competent mothering which is a fairly common skill in married women of mature age (our untrained part-time nurses tend to have it in good measure). Unfortunately, the pattern of general nursing training, with its emphasis on purely technical abilities, is still such as to spoil rather than to foster this kind of skill in human relationships. Nurses in general hospitals tend to be far more upset by the presence of a "psychiatric patient" than is the community at large.

I would therefore recommend that the psychiatric patient with minimal disability should be cared for either by untrained nurses (under psychiatric supervision); or, if the general-trained nurse is the only possibility, she should have been away from general nursing for long enough to have recovered from it—say, at least five years.

Hollymoor Hospital, Northfield, Birmingham. J. R. MATHERS.

PSYCHOSIS AND TREMOR DUE TO MECAMYLAMINE

SIR,—We have a gentleman in the ward at the moment with what we believe to be the mecamylamine toxic syndrome described by Dr. Harington and Dr. Kincaid-Smith (March 8).

He came to us seven months ago as an emergency with an episode of hypertensive encephalopathy, and while in the ward had a minor subarachnoid hæmorrhage. His blood-pressure was 260+/110 mm. Hg and blood-urea 27 mg. per 100 ml. His recovery from these complications was uneventful but we found it necessary to keep him on a dose of 30 mg. of mecamylamine six-hourly and he was later discharged on this dosage. At this time his blood-pressure was 180/120 and his blood-urea 25 mg. per 100 ml.

He was followed up at regular intervals and made good progress. In February he was normotensive and had a blood-urea of 45 mg. per 100 ml.

Two weeks ago he was readmitted because of a generalised coarse tremor and difficulty with his speech. There was also some pruritus of the legs. The tremor affected his whole body and was present at rest so that his bed shook. It was accentuated by voluntary movement and so much so that he was unable to

5. Cummings, A. J. *Lancet*, 1957, ii, 598.
6. Gobert-Jones, J. A. *ibid.* p. 1068.
7. Owen, J. A. *ibid.* p. 1286.

drink a cup of tea. There were no hallucinations or other mental changes, however, and no localising signs in the central nervous system. His blood-pressure was now 240/130 and blood-urea 66 mg. per 100 ml.

The mecamylamine has been withdrawn since then and there has been a marked improvement in his symptoms. His tremor is such that he can now write legibly and speech is no longer slurred and jerky. His blood-pressure remains at 240/140 and his blood-urea is 53 mg. per 100 ml.

This case seems to fit in with the syndrome described by Dr. Harington and Dr. Kincaid-Smith. Three features we feel are of special interest: (1) the very high dosage of mecamylamine; (2) the satisfactory response to withdrawal of the drug; and (3) the fact that only two blood-urea estimations during the whole illness have been slightly above the upper limit of normal. In view of these facts we are not convinced that any part of his symptom complex was due to uræmia.

The General Hospital,
Chester-le-Street,
Co. Durham. JOHN A. LENNOX.

THE FUTURE OF THE PUBLIC HEALTH LABORATORY SERVICE

SIR,—Your comment (April 5, p. 730) that the separation of the Public Health Laboratory Service from the hospital laboratory service is in places too wide deserves study.

The field of the P.H.L.S. is bacteriology applied to preventive medicine, but between this and other branches of medical bacteriology it is no longer easy to draw a sharp line. Is the throat swab taken from the child suspected of having scarlet fever to confirm the diagnosis or for the benefit of his contacts or of the community? The virtual disappearance of such diseases as typhoid fever, the radical changes in the management of tuberculosis, and the improved prognosis in, for example, puerperal infections, have all helped to confuse a distinction which was much clearer twenty years ago. The isolation hospital and the tuberculosis clinic, both former preserves of the P.H.L.S., are now administered by the regional hospital board. Almost everywhere the general practitioner can send his specimens to the hospital laboratory. Except for water and foodstuffs the number of bacteriological specimens provided by the health departments of local authorities seems to be less than it was. The P.H.L.S has done excellent work in diagnostic virology in many places, but it is only a matter of time before the hospital laboratories take advantage of the experience obtained in this field.

The P.H.L.S. has had advantages in its generous scales of technical staff and equipment. It has provided good opportunities for work with the minimum of interference and red tape. It has developed an admirable esprit-de-corps. It has almost certainly done much to raise the standards of medical bacteriology in this country. It has produced much original work of high quality and in particular has demonstrated the value of large-scale cooperative investigations. Nevertheless it is now open to argument whether we can afford to maintain a duplicated bacteriological service except in those towns large enough to provide sufficient public-health bacteriology to keep one laboratory busy. In the smaller towns public-health bacteriology seldom provides more than a part of the work of the P.H.L.S. laboratories which fill in their time with the leavings of the hospital laboratories and even compete with them for the custom of the general practitioners.

It is not a question of abolishing the P.H.L.S. but of examining its structure and working to see how best it may take its share of the medical bacteriology without lowering its standards or forgetting its traditions. The time is past when laboratories could be established and conducted on an empirical basis. The planning of hospital services has advanced to the point where we can make a reasonable guess about the needs of the next twenty-five years. The P.H.L.S. laboratories should be fitted into these plans as soon as possible, not by local and informal agreement but in accordance with some integrated design.

A PROVINCIAL PATHOLOGIST.

BUDGERIGARS AND POLIOMYELITIS

SIR,—Haunted by the budgerigar carrying polio virus, we have examined those sera of household pets still in our deepfreeze (dating from 1951 till March, 1958) for neutralising antibodies against all 3 types of poliovirus. The sera were tested with a modified colour test in plastic plates in a dilution of 1 in 10. 37 budgerigars, 4 parrots, 2 canaries, 52 pigeons, 2 cats, and 5 dogs had no neutralising antibodies in their serum, but 1 dog had antibodies against polio type-I in his serum.

It seems that polio infection in household pets, at least in Holland, might be a rare event.

Virus Laboratory,
Laboratorium voor de Gezondheidsleer,
University of Amsterdam. F. DEKKING.

THE BURNING-FEET SYNDROME

SIR,—You have commented (March 8) on Bibile et al.'s report [1] that they had failed to observe any significant difference in the proportion of cures obtained in the burning-feet syndrome between pantothenol (alcohol derivative of pantothenic acid) and a placebo. Of 38 patients they treated with pantothenol orally or parenterally, 22 were either cured or improved. On the other hand, out of 18 patients treated with a placebo, 11 were either cured or improved. Dr. Bibile and his coworkers have rightly concluded that pantothenic-acid deficiency was not the cause of burning feet *in the patients investigated by them.*

On the other hand, the fact that pantothenic-acid deficiency may produce burning feet is suggested by a number of observations.

In burning feet associated with signs of vitamin-B-complex deficiency, benefit has followed on administration of pantothenic acid.[2] Defective acetylation of para-aminobenzoic acid, indicating pantothenic-acid deficiency, has also been reported in these cases.[3] The work of Bean et al.[4] has provided further evidence of the role of pantothenic-acid deficiency in burning feet. By administering a pantothenic-acid antagonist to human volunteers, these workers were able to produce paræsthesia of the limbs, burning feet, and hyperactive reflexes. When pantothenic acid was given, the paræsthesiæ, including burning feet, disappeared completely.

In the light of this evidence, the question arises whether the burning feet investigated by Bibile et al. were in fact of nutritional origin. In this connection their observation that they obtained improvement in 11 out of 18 cases treated with a placebo alone would seem significant. Your annotation does not draw attention to this important point.

The duration of the disease before treatment in their cases was reported to vary from as long as eighteen to forty-four

1. Bibile, S. W., Lionel, N. D. W., Dunuwille, R., Perera, G. *Brit. J. Nutr.* 1957, **11**, 437.
2. Gopalan, C. *Indian med. Gaz.* 1946, **81**, 22.
3. Sarma, P. S., Menon, P. S., Venkatacholam, P. S. *Curr. Sci.* 1949, **18**, 367.
4. Bean, W. B., Hodges, R. E., Daum, K. *J. clin. Invest.* 1955, **34**, 1073.

months. The fact that they obtained such gratifying results with placebo alone (cure or improvement in 11 out of 18 cases) seems to throw doubt on their nutritional origin. It seems very unlikely that a syndrome of chronic malnutrition of several months' duration could be so successfully treated with a placebo in four weeks. In the selection of their cases Bibile et al. were apparently guided solely by the presence of paræsthesia of the limbs. Their table listing the clinical features does not mention such signs of vitamin-B-complex deficiency as angular stomatitis, glossitis, scrotal dermatitis, &c. On the other hand, all the cases of burning-feet syndrome that benefited from pantothenic-acid [2] had shown advanced signs of vitamin-B-complex deficiency. In these cases hyperhidrosis was much more evident and actual aching in the limbs much less prominent than in the series of Bibile et al. Evidently the two series were different not only ætiologically but also clinically.

Paræsthesia of the feet may of course have many causes, and it is obviously unjustifiable to attribute all burning feet to malnutrition. In our own clinic in Coonoor, we see some burning feet unassociated with clinical evidence of malnutrition, in which naturally no nutritional therapy, including pantothenic acid, yields significant benefit. Moreover, acetylation of *p*-aminobenzoic acid has been found normal in these cases. It is possible that some of them are of functional origin, and may improve with suggestion and administration of placebo.

Nutrition Research Laboratories,
Indian Council of Medical Research,
Coonoor, Nilgiris, South India. C. GOPALAN.

TOTAL EXCHANGEABLE SODIUM IN HÆMORRHAGIC SHOCK

SIR,—Plasma volume is diminished in most cases of hæmorrhagic and traumatic shock. There are, however, few data on the behaviour of the extracellular space in shock.[1] We have investigated the question by continuous determination of ^{24}Na space (indicating total exchangeable sodium) in dogs in the normal state, in posthæmorrhagic hypotension, and after reinfusion of the blood.

The dogs were given about 20 μc of ^{24}Na intravenously, and the ^{24}Na space was calculated after 3 hours by the usual technique. Bleeding and reinfusion were carried out by the standard technique of Wiggers [2] (90 min. at 50–60 mm. Hg, 45 min. at 30–40 mm. Hg). The ^{24}Na space was repeatedly determined in the hypotensive period and after reinfusion for about 6 hours.

Six dogs died in shock within 2–6 hours of reinfusion. Six survived the 6-hour period. In all the dogs which succumbed to shock the ^{24}Na space showed a progressive increase up to 25% of the control values. In the survivors, there was no change in sodium space. The plasma-sodium level remained unchanged in all experiments.

As we have previously observed in nephrectomised dogs that the inulin space does not change in hæmorrhagic shock, the increase of the ^{24}Na space—with the plasma-sodium levels unchanged—can hardly be due to the increase of extracellular sodium. Accepting inulin space as a measure of extracellular space, the increase in exchangeable sodium must be the consequence of the increment of intracellular sodium. That part of the intracellular sodium which is not exchangeable under normal conditions probably becomes exchangeable in shock.

A detailed account of our data will be published elsewhere.

L. HÁRSING
J. NAGY
G. KÖVÉR
E. DUBECZ.

Physiological Institute and
Institute for Medical Physics,
Medical University, Budapest.

1. Rosenthal, S. M., Millican, R. C. *Pharmacol. Rev.* 1954, **6**, 489.
2. Wiggers, C. J. Physiology of Shock. New York, 1950.

THE DOCTOR'S ATTITUDE TO HIS PATIENT

SIR,—Like Dr. Ryle (March 1) I have been waiting for a gun of some calibre to sink Dr. Clyne (Feb. 1) and am only tempted to interfere by the absence of any such "official" armament and from the presence now of a second sail, Dr. Pasmore (March 8).

I read Dr. Clyne once and thought it was queer that the article had arrived there at all; then I read it again with more sympathy for his difficulties; and I have read it a third time but still cannot let him off. I kept thinking he should look at Luke Fildes' picture; he would find there another doctor who could not say what was wrong with his small patient but at least was observing the clinical course. Admittedly his vigil is hypocritical in being valueless to the child, but he may have learnt something himself. I am sure that is not what Fildes wanted to express; he was after the love and devotion; but more factually that doctor's only hope was to know better next time. I am using this example to suggest that Dr. Clyne has been unfortunate in trying to hang his analytic weeds on an unsuitable peg, because they fall to a heap as certainly as it is obvious that when he received that call that morning he could not write his paper at the same time as know what was the matter with the child.

Seen this way it becomes plain that his guilt-hostility discussion could never have arisen if his clinical wit and decision had not been clouded by his eagerness to pay attention to other things than the child's disease; you remember that Fildes kept the parents dark in the background, and Dr. Clynes tacitly demonstrates the only person who took an objective view of the case, the patient's father, who is dubbed for his strength a weak character. The document is therefore anti-clinical; Dr. Ryle thinks it anti-scientific as well, but that does not concern me so much. Anti-clinical it is, and the range is the same for the second sail, Dr. Pasmore.

You have offered him broadside by publishing his fuller article in the same issue (March 8) as his letter. His basal error is the same as that of Colin Wilson, who wrote a most attractive book about a bunch of most attractive lunatics. Unfortunately he tried to draw a social lesson from them and foundered on the fallacy. There are lessons to draw from such people, either their lunacy with or without the charm, or the charm without the lunacy; none of these three is a social lesson, meaning a moral or ethic applicable to other people. Modern medicine is in the same quandary towards the recently unearthed mass of minor neurotics, who always were present of course but did not go to doctors. There is no social lesson to learn from these people and it is a fallacy to think there is; and if the profession swallows them whole it can only become neurotic itself; if it is wise it will take what it wants off this world (after all, who wishes to be unemotional?), and it will leave the rest either to recover, as many do, remain neurotic, as many do, or become psychoneurotic, as very few do. It is however anti-clinical to move the couch too near the confessional and it brings queer reasoning. Dr. Pasmore betrays great pride and complacency when he unearths the fact that his "intelligent secretary" was not so much worried by the poliomyelitis of her cousin as the loss of her fiancé. But what would have been the doctor's illumination if these trophies had been dug up in the other order, as they could have been?

This sort of inquiry is specious but not specific; all it says is that this patient is the sort of patient who is likely to make a muddle of a romance, fair enough, is likely to

be greatly upset when it crumbles, fair enough, can also be upset by the poliomyelitis of her cousin, fair enough, is emotionally insecure, fair enough, but is quite capable of either a happy marriage or a useful life, or both, fair enough. The emotional history should not have any direct influence on the doctor's clinical opinion, in this case, the reason why her legs were weak. This reason may be functional as we all know, but the clinician reaches that opinion without the emotional history, and can give just as good advice and can get just as good a result without ever hearing it.

SCANNER.

SIR,—I thought Dr. Ryle's letters were very refreshing, and Dr. Pasmore's perhaps a shade irascible from one adept at suppressing parts of his personality. I also confess to "outmoded obscurantism" and delude myself into thinking that I can "achieve a reasonable understanding without undergoing personality change". Nor do I see anything unsound in our giving what active, positive advice we truthfully think is most helpful, according to our own principles, biases, morals, religions, and backgrounds. We are, doctors and patients, all irrational human beings in it together and, unfortunately, analysis or personality change, whilst making a doctor more aware of his own emotional characteristics (why "disabilities"?), may not make him wiser or kinder, warmer-natured or more intelligent, or less of a crank than he might otherwise have been.

The negative, passive attitude (What do you think I should do doctor? Well, what do *you* think?) mistakenly assumes most patients to be unable, inwardly or outwardly, to criticise us, or our advice, to amend or to reject it, or indeed to have any sensible view of our fallibilities at all. Conversely, to assume that analysis or personality change produces in the doctor a mind so aloof from its own peculiarities that it can be used on fellow humans as a "scientific instrument" betrays a humourless superiority of attitude, a conviction of post-analytical rightness, that some of us find the least acceptable facet of the psychiatric approach.

London, S.W.7. BENJAMIN LEE.

SIR,—Dr. Pasmore (March 29) has restated his case with vehemence but no new evidence.

Can he cite references for his bald claim that "scientific inquiry has shown that the psychoanalyst cannot practise his specialty without undergoing an analysis himself, and recent research suggests that the general practitioner cannot attempt similar work in a limited field without undergoing some modified analysis or personality change"? Dr. Pasmore may be convinced that psychoanalytical theory is true but he has no right to close his eyes to the fact that non-analysed psychiatrists and G.P.s who have never been to a Tavistock seminar are treating neuroses.

One of the reasons for my original letter criticising Dr. Clyne's article was to question its apparent assumption that the tenets of psychoanalysis were proven. A widely held opinion does not constitute a scientific fact, and psychoanalysis remains scientifically dubious because it is full of untestable hypotheses and hence prone to repeated revision, schism, and inconsistencies, because it pays so little heed to allied sciences and because its claim to exclusive therapeutic efficacy remains unproved.[1 2] Workers holding non-analytical views have reported results as good or better and usually quicker—e.g., Phillips [3] and Wolpe [4]—and are able to explain and accept the effects of analysis, a tolerance not often reciprocated. T. A. Ross, whose books [5 6] did so much to introduce psychotherapy into general practice, was much concerned lest the analysts, with their claim to exclusive truth, should gain control of the teaching of the neuroses; his warning [7] deserves re-reading today.

London, N.W.5. ANTHONY RYLE.

1. Denker, P. C. *N.Y. St. med. J.* 1946, **46**, 2164.
2. Eysenck, H. J. *J. Consult. Psychol.* 1952, **16**, 319.
3. Phillips, E. L. Psychotherapy: a Modern Theory and Practice. Prentice Hall, New Jersey, 1956.
4. Wolpe, J. *Arch. Neurol. Psychiat.* 1954, **72**, 205.
5. Ross, T. A. The Common Neuroses. London, 1937.
6. Ross, T. A. Analytical Psychotherapy. London, 1932.
7. Ross, T. A. *Edinb. med. J.* 1935, **42**, 445; *ibid.* p. 505.

MITRAL VALVOTOMY AND PREGNANCY

SIR,—That mitral valvotomy is valuable is established. If, however, valvotomy is to be allotted its proper place in the management of the pregnant woman with mitral stenosis, it should be compared only with the best method of treatment hitherto available—namely, strict medical supervision allied to conservative obstetrics.[8 9] Since therapeutic abortion is not only valueless but positively dangerous, it is unfortunate that Dr. Wade and his colleagues (March 15) should join Das and Chesterman [10] in confusing this important issue by recommending valvotomy as a substitute for termination.

In our recent series of 289 cases of rheumatic heart-disease complicated by pregnancy,[9] in which no therapeutic abortion was performed, 1 mother failed to survive the puerperium and 8% of all conceptions failed to survive the neonatal period. Our conclusion that therapeutic abortion is of no value has been confirmed by Gorenberg.[11 12] On the other hand, Jones [13] showed that abortion is dangerous: he recorded 2 maternal deaths due to therapeutic abortion in a series of 352 heart cases. In this series the fœtal wastage directly due to termination was 6·4%. Fitzgerald et al.[14] corroborate this in reporting 3 maternal deaths in 450 cases. All 3 deaths followed termination.

Valvotomy was performed during pregnancy in 3 of our 289 cases. In each case mother and baby survived. Dr. Wade and his colleagues performed the operation on 12 pregnant women, but do not state the total number of cases from which these were selected. Of the 12, 1 mother died; 1 developed a hemiplegia; 1 had a rheumatic recrudescence with associated heart-failure and 1 had pulmonary œdema post partum. 2 babies were lost.

We submit that this evidence does not invalidate our conclusion that, when a patient with mitral stenosis responds favourably to medical treatment, operation should be deferred until after delivery.[9]

M. K. O'DRISCOLL
M. I. DRURY.

Dublin.

A BALANCED HOSPITAL COMMUNITY

SIR,—The ideas suggested by Professor McKeown (April 5) for a balanced hospital community are an admirable contribution to medical planning and development, but I wish that he had gone further still.

His theme of centralising hospital buildings and administration to achieve a better and a wider service for the community can be applied with even more force to the National Health Service as a whole. Just as the hospitals are at present dispersed and isolated, providing a limited service for selected groups of patients, so we have in the N.H.S. a system whereby the three branches—hospitals, general practitioners, and public-health workers—are administered and organised by three separate and distinct

8. Drury, M. I., O'Driscoll, M. K., Hanratty, T. D., Barry, A. P. *Brit. med. J.* 1954, i, 70.
9. O'Driscoll, M. K., Barry, A. P., Drury, M. I. *ibid.* 1957, ii, 1090.
10. Das, J. B., Chesterman, J. T. *ibid.* 1958, i, 142.
11. Gorenberg, H., Chesley, L. C. *Obstet. Gynec.* 1953, **1**, 15.
12. Gorenberg, H. *Amer. J. Obstet. Gynec.* 1955, **69**, 1253.
13. Jones, A. M. Heart Disease in Pregnancy. London, 1951.
14. Fitzgerald, J. E., Webster, A., Zummo, B. P., Williams, P. C. *J. Amer. med. Ass.* 1951, **146**, 910.

bodies (the hospital committee, the executive council, and the local authority) each working away on its own with no more than a superficial contact with the other two. All three are concerned with promotion of health and the prevention and treatment of disease. Surely it would be rational to expect them to be planned, organised, and administered as single units, working together in cooperation for a common cause.

I should like to suggest that we think of the future in terms of such a unified health service administered by a common body for each area. These areas could conveniently be the present hospital group regions with the main hospital in each area serving as the focal point for all three medical branches. The hospitals, general practitioners, and public-health workers would then be organised from a single source and this should add to a mutual appreciation of each other's problems and lead to a more cooperative spirit in a more efficient service.

Beckenham, Kent. JOHN FRY.

Diary of the Week

APRIL 13 TO 19

Monday, 14th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5.15 P.M. Mr. Rodney Smith: Pancreatitis.
6.30 P.M. Mr. Rainsford Mowlem: The Treatment of Lymphœdema.

Tuesday, 15th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
3.45 P.M. Dr. R. McP. Livingston: The Human Embryo—Development of Form. (Arnott demonstration.)
5.15 P.M. Sir Arthur Porritt: Non-malignant Conditions of the Breast.
6.30 P.M. Mr. Ronald Furlong: Osteo-arthritis of the Hip.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. J. St. C. Elkington: Cerebral Vascular Disease in the light of Modern Techniques. (First Lumleian lecture.)

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean Street, W.1
5.30 P.M. Dr. G. F. Swann: Observations on Cerebral Arteriography.

BIRMINGHAM MEDICAL INSTITUTE, Edgbaston, 15
8 P.M. *Psychiatry*. Dr. E. S. Stern: Figuring it out—a statistical Approach to Psycho pathology and Prognosis.

Wednesday, 16th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5.15 P.M. Prof. F. A. R. Stammers: Complications of Gastrectomy.
6.30 P.M. Sir Harry Platt: Congenital Dislocation of the Hip.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Comparative Medicine and Pathology*. Dr. Jack Colover, Mr. R. M. Barlow, Prof. C. E. Lumsden: Recent Advances in Demyelinating Disease.
8.15 P.M. *General Practice*. Dr. H. G. Barnes, Dr. W. F. Hudson, Dr. J. D. Huntley, Dr. P. M. Higgins, Dr. P. A. Walford, Dr. Stephen Taylor: Management of Practice.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY
8.30 P.M. (Royal Society of Arts, John Adam Street, W.C.2.) Sir Gordon Gordon-Taylor: On Tradition.

OXFORD UNIVERSITY
5 P.M. (Radcliffe Infirmary.) Dr. John Kirklin: The Surgical Treatment of Tetralogy of Fallot. (Litchfield lecture.)

Thursday, 17th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. A. G. Jessiman: Hypophysectomy in the Treatment of Breast Cancer. (Hunterian lecture.)
6.15 P.M. Prof. C. A. Wells: Prostatic Obstruction.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. Elkington: Cerebral Vascular Disease in the Light of Modern Techniques. (Last Lumleian lecture.)

ROYAL SOCIETY OF MEDICINE
8 P.M. *Surgery*. Dr. J. W. Kirklin (Mayo Clinic): Repair of Atrial and Ventricular Septal Defects.

INSTITUTE OF PSYCHIATRY, Maudsley Hospital, S.E.5
5 P.M.: Dr. A. B. Hollingshead: Social Class and the Treatment of Mental Illness.

Friday, 18th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5.15 P.M. Mr. R. G. Pulvertaft: Reconstructive Surgery of the Hand.
6.30 P.M. Mr. Selwyn Taylor: Radioactive Isotopes as an Adjunct to Surgery.

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and Preventive Medicine*. Dr. R. S. F. Schilling, Dr. J. C. Gilson, Mr. S. A. Roach: Epidemiology of Byssinosis.
8.15 P.M. *Radiology*. Dr. E. Duff Gray: Radiological Aspects of Biliary Tract Disease. (Presidential address.)

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
5.30 P.M. Mr. J. C. Hogg: Treatment of Frontal Sinusitis.

Obituary

HECTOR CHARLES CAMERON

M.A., M.D. Cantab., M.A. Glasg., F.R.C.P.

Dr. Cameron, author of *The Nervous Child* and a pioneer of child guidance, died on April 1 in his 80th year. The distinction of his mind and character, as well as of his work and writings, gave him much influence in pædiatrics, and he had a considerable share in its remarkable development.

Son of Sir Hector Cameron, professor of clinical surgery at Glasgow, he went back to his native city when he left Clifton College, and took a Glasgow arts degree. He then entered St. John's College, Cambridge, as a foundation scholar in science, gained a first-class in the natural sciences tripos, and won a university scholarship at Guy's Hospital. Qualifying in 1905, he was for a time demonstrator in physiology, and got the varied clinical experience obtainable in those days, combining at one time the appointments of medical registrar and tutor, assistant pathologist, physician to the nursing staff, and anæsthetist. When he joined the Guy's honorary staff in 1911 he had been working as clinical assistant at the East London Hospital for Children and at the Evelina; and he decided to specialise in diseases of children. Previously he had shown his literary bent as editor of the hospital gazette, and had already produced a succession of papers beginning with one on metastatic cerebral abscess, written with Mr. W. M. Mollison, in *Guy's Hospital Reports* in 1907. His *Diet and Disease in Infancy* appeared in 1915 and the first edition of *The Nervous Child* in 1919. A master of the spoken as well as of the written word, he could tell a story supremely well, and his teaching, sometimes entertainingly acidulated, contained many of the sayings and anecdotes that stick in the mind.

On bedwetting for instance, he said:

"Often the trouble with the enuretic child is not that he doesn't care but that he cares too much". And he told of a school where a housemaster wanted a boy expelled because he was a bedwetter. "No", said the headmaster; "these are the boys who win scholarships."

Cameron was one of those doctors who have a really comprehensive approach to their patient's problem, considering not only the anatomical and biochemical disturbance but what is going on in his mind. In consequence Guy's was the first teaching hospital to have, in 1931, a child-guidance department; and in the United States in the middle 1930s Cameron was by many regarded as the doyen or originator of the child psychiatry movement. This was at a time when his teaching on these lines was largely ignored by his pædiatric colleagues.

Outside his specialty, he did some regular life-assurance work, which kept him in touch with the medicine of adults—though some felt sorry that he should have to divert any of his attention from the special subject to which

he had so much to contribute. Later, in years of retirement, he was able to make full use of his gifts as a historian.

Such is the merest outline of a long and exceptionally fruitful life. A clearer idea of his contributions to medicine, as thinker, clinician, and writer, is given by the following more personal tributes, the first from a senior, the second from a junior.

Cameron belonged essentially to the older school of pædiatricians who depended for their results more on careful clinical observation than on laboratory reports. He started his career with some initial advantages: a family bias towards medicine, a fund of sound Scotch commonsense, a dry sense of humour, and—most important of all—a real love for children. But the high position he reached in his chosen specialty was the result of steady hard work. He first became known as a teacher at Guy's, and later to a wider circle, by his writings; for he was a ready writer and made many contributions to pædiatric literature. Much the best known of these was his book on *The Nervous Child*, which is indeed almost a classic and is so delightfully written and contains so much sound sense and good advice that it can be put in the hands of even lay people interested in child guidance.

Cameron was an ardent member of the British Pædiatric Association and one of his latest writings was a history of the Association published two or three years ago. He rarely missed being present at the annual meeting of the B.P.A. and was one of its most popular members, being admired by his fellows for his knowledge and beloved for his modesty and friendliness. He will be much missed in the Association and indeed by the whole pædiatric world; but he has left an example in his character and work which should be an inspiration to those who follow him in the study and care of child health.

R. H.

To pass down the Colonnade at Guy's for the first time and to cross the Park seemed to the university man in the early years of the present century only a familiar experience repeated; and when the Medical School had been gained, there awaited a welcome from a particularly charming don, the Dean himself. This prepossessing person was Dr. Hector Charles Cameron, a physician of Guy's and one of the men who upheld its fame, a pioneer in the art of medicine and a man of unsurpassed urbanity. Though Cameron was well versed in scientific knowledge, he was more akin to a creative artist in mind. By his power of perception he was able to apprehend the true and the beautiful, or in a word the good; by means of his imagination he related what he had perceived to human life; and the synthesis accomplished, he gave expression to the idea through the art of medicine. Out of such a philosophy, essentially Platonic, certain consequences must ensue. The patient had to be seen as a whole, for health of mind and health of body are equally desirable and interdependent. From that notion a practical psychology was formulated, which, less far-reaching than the modern variety, was a great deal more agreeable and wonderfully serviceable. The bulk of this original doctrine he embodied in a book, *The Nervous Child*, which made his name known far and wide. His ideas gradually shaped his career. Having made a start as a general physician, as was the way, he found himself drawn towards mother and child, partly because they satisfy so well the aesthetic faculty, partly because they are plastic material, which holds out to the artist the promise of success. Then, since an ideal conclusion is the business of our art as he conceived it, illness must be prevented as well as cured. Finally, it would wrong him not to say plainly that a Platonic philosophy is an aspiration towards love: Cameron was a true lover of his kind.

As a teacher he won great admiration. He was always lucid; he never failed to interest; he had wit, wide reading and knowledge of the world, an easy eloquence and a polished style. He charmed with his appearance and delightful courtesy; and with his artist's imagination he held his hearers. The good that came from these ideal qualities was enhanced by two others not always their companions, industry to wit and practical ability. It seems the natural thing today to gather the children into an outpatient department or house them in their own ward under the care of one who understands them, but Cameron had to accomplish these advances and was one of the first to do so. Then with a fine stroke he founded a welfare centre in the precincts of the hospital. Now only those who can set the child of forty years ago or more beside the handsome, happy creature of today can know what a revolution Cameron wrought, with others at his side.

After his retirement he continued to exercise his pure and limpid prose. *Joseph Lister the Friend of Man*, *Sir Joseph Banks the Autocrat of the Philosophers*, and his domestic history, *Mr. Guy's Hospital*, are all valuable works. He reached a hale old age, showing no alteration for years; and now that he is gone, it may seem commonplace to observe that he cannot be replaced. Yet it is true, for the broad civilisation in which he was reared is being ousted by something very different. *Damnosa quid non imminuit dies?* But where he is concerned, who shall repine? He leaves the record of a fine vocation nobly fulfilled, great good accomplished, a blameless life and unswerving friendship.

H. St. H. V.

Dr. OLIVE STERN

R. M. H. writes:

Olive Stern's background was richly cultural, which enhanced to the full her mental qualities. She was incisive in expression and her construction was as fine as the finest rapier. Naturally, this did not appeal to all, but to those who understood and appreciated it was just that diminutive creature who could smoke cigarettes, cigars, and a pipe and back her fancy in the Lincoln, Leger, National, and Derby. She was spontaneously generous and one remembers with gratitude the hospitality extended in the delightful Old Billing home and later in Town. "Petrol fumes" were the spice of life to her as they brought to mind her constant love—London—where with J. G. Greenfield, for whom she had a disciple's devotion, she was more than happy. Her basic interest was neuropathology, but in general she was the vivid possessor of a tremendous wealth of detailed medical knowledge which proved invaluable to those who sought her opinion—and acted on it. Politically she was a bonny fighter and with the same undaunted courage she faced her final illness.

SYLVANUS PERCIVAL VIVIAN

Kt., C.B.

Sir Sylvanus Vivian, formerly Registrar General, died on March 28 at the age of 77.

In 1919 the General Register Office was brought within the province of the new Ministry of Health, and Vivian, who had worked in various departments of the Civil Service, was appointed Deputy Registrar General. He succeeded Sir Bernard Mallet as Registrar General in 1921 and he supervised the census of England and Wales in that year and in 1931. His office was chiefly responsible for the compilation of the wartime National Register. He was a member of the Boundary Commission in 1944 and retired in 1945, to be succeeded by Sir George North. Outside his official life he had wide literary interests, and edited the works of Thomas Campion and contributed to encyclopædias.

Appointments

EVANS, G. P. A., M.B. Glasg., D.P.H.: deputy M.O.H., Walsall.

SAMUEL, ERIC, M.D. Lond., B.SC. Wales, F.R.C.S., F.F.R., D.M.R.E.: head of the department of radiodiagnosis, Edinburgh Royal Infirmary.

Notes and News

DIET AND HEART-DISEASE

THE American Heart Association has issued to the public a leaflet on what is known and what is not known about the relation between diet and heart-disease. It deals with fat, fads, sodium, and obesity—politely termed "overweight".

Readers are told that collections of fatty substances on the inside lining of the coronary arteries underlie most heart attacks, and that research is being done on whether changes in the diet can affect these; doctors may recommend low-fat or low-cholesterol diets in specific cases. It is a mistake to listen to the tales of friends, relations, or popular magazines—"your health is much too precious to entrust to any person other than your doctor." Deposition of fat when more calories are absorbed than used is compared to piling up a bank account by depositing more than is withdrawn; but overweight, unlike a fat bank account, is not a good thing, because it adds to the work of the heart. Sodium is essential to life, but its intake is sometimes restricted deliberately because in certain conditions it retains water in the body.

The leaflet emphasises the importance of individual advice by a doctor in individual cases; it ends with five points to keep in mind—urging good general nutrition, efforts to keep weight normal, avoidance of special diets unless they are advised by a doctor, following a diet strictly where one has been prescribed, and asking a doctor's help about anything not understood.

The Association's address is 44, East 23rd Street, New York 10, N.Y., U.S.A.

University of Cambridge

On March 22 the following degrees were conferred:

M.Chir.—T. W. Rowntree, E. J. C. Wynne.
M.B., B.Chir.—D. E. Side.
M.B.—R. C. Dobbie (by proxy).

University of Birmingham

On July 5 the honorary degree of LL.D. is to be conferred on Dame Hilda Rose, a past president of the Royal College of Obstetricians and Gynæcologists, and the honorary degree of D.SC. on Prof. A. M. B. Lacassagne, director of the Radium Institute at the Pasteur Institute, Paris.

Dr. G. H. Thomas has been appointed senior lecturer in endocrine chemistry in the department of anatomy.

University of Durham

On July 5 the honorary degree of D.C.L. is to be conferred on Sir David Campbell, regius professor of materia medica and therapeutics in the University of Aberdeen and president of the General Medical Council.

University of Leeds

At a recent examination O. P. Edmonds obtained the degree of M.D.

University of Dublin

The following have been awarded the diploma in gynæcology and obstetrics (D.G.O.):

Mya Mya Aye, J. O. Foohey, F. D. Heelan, Khalida Abdul Wehab Al Kayssi, J. D. Le Souef, Shalini Tanavde.

Royal College of Physicians of Ireland

On March 28 the following were granted the licence in medicine and midwifery:

J. G. Bailie, Efiong Ekpo, J. R. McClean, Frances M. U. Power, Subhan Ally Ramjanally, R. F. Rampersad, J. D. Rautenbach, Ewa Wohnout.

Royal College of Obstetricians and Gynæcologists

On Friday, May 30, at 5 P.M., at the college, 58, Queen Anne Street, London, W.1, Mr. J. S. Scott will give a William Blair-Bell lecture on pregnancy toxæmia associated with hydrops fœtalis, hydatidiform mole, and hydramnios. Admission is by ticket which may be had from the secretary of the college.

Central Midwives Board for Scotland

The medical members of the reconstituted board are as follows:

Mr. J. Bruce Dewar (Dumfries), Prof. David McKay Hart (Glasgow), Dr. Catherine Harrower (Glasgow), Prof. R. A. Lennie (Glasgow), and Dr. Nora Wattie (Glasgow).

South West Metropolitan Regional Hospital Board

The following have been awarded prizes in the board's 1957 competition:

Consultants and S.H.M.Os.—Dr. A. A. Cunningham and Dr. J. Towers.
Senior registrars, registrars and J.H.M.Os.—Mr. J. C. Gazet, Dr. A. J. Taylor, Mr. P. W. Seargeant, Dr. J. R. H. Pinkerton, and Dr. P. Farnan.
Senior house officers.—No entries received.

Notice of entry for this year's competition (with proposed subject) should be sent to the board's senior administrative medical officer (Gen./CST) by Sept. 30, and reports must reach him by Dec. 31.

British Association of Pædiatric Surgeons

The annual meeting of this association will be held in London from July 23 to 25. On Wednesday, July 23, at 5.30 P.M., Dr. Willis Potts, from Chicago, will give the Simpson-Smith lecture on tracheoœsophageal fistula with and without atresia, and on Friday, July 25, at 4.30 P.M. the Moynihan lecture on respiratory emergencies in the newborn. Further particulars may be had from Mr. R. B. Zachary, The Children's Hospital, Sheffield, 10.

Royal Commission on Remuneration

The Royal Commission on Doctors' and Dentists' Remuneration will hold a public hearing on Thursday, April 17, at 10, Carlton House Terrace, London, S.W.1. Representatives of the Ministry of Health, the Department of Health for Scotland, and the Treasury have been invited to attend. The hearing will begin at 11.15 A.M. and is likely to continue into the following day.

Industrial Health and Accident Prevention

A conference on this subject, organised by the Industrial Welfare Society with the support of the Scottish Industrial Groups Advisory Council and the Association of Industrial Medical Officers, will be held at the St. Enoch Hotel, Glasgow, on April 30. The speakers will include Dr. Andrew Meiklejohn, Dr. J. H. Bell, and Dr. A. Girdwood Fergusson.

Portrait of Sir Alexander Fleming

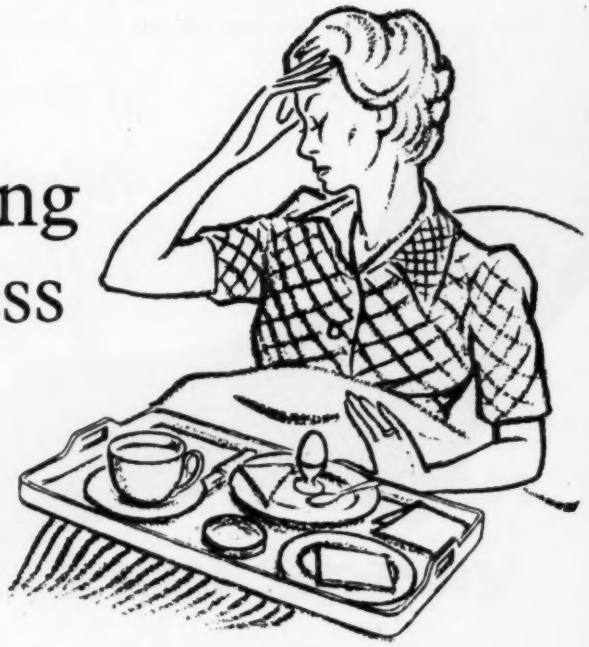
On March 26 at St. Mary's Hospital, London, Prof. C. A. Pannett unveiled a portrait of the late Sir Alexander Fleming, by Miss Anna Zinkeisen, which is to hang in the boardroom of the hospital. It was remarkable, he said, that though St. Mary's is little more than a hundred years old and has possessed scientific laboratories for only a fraction of that time, already two workers in those laboratories have attained imperishable fame, and both by saving countless human lives—Almroth Wright by his invention of anti-typhoid inoculation and Alexander Fleming by his discovery of penicillin. To those who knew them it was a sad and chastening thought that to neither had been raised a great scientific institute, nor had there been created, as a tribute to their memory, a scientific foundation in any way commensurate with the benefits they had conferred on the hospital and the world. The same treatment had been handed out to Jenner, and it was typical of the English indifference to great men and particularly to the humble scientist. However, this portrait, commissioned by the governing board, was impressive and successful, a superb piece of craftsmanship; and as Sir Alexander gazed down on the members in their deliberations, they would be aware of the greatness of St. Mary's and the nobility of their task.

On Monday, April 14, at 7.30 P.M. at 5, Old Burlington Street, London, W.1, the Society for Visiting Scientists will hold a meeting on Personality. The speakers will be Prof. Marc Klein, of Strasbourg, Dr. W. Mays, and Dr. J. D. Sutherland.

A meeting of the Naval Medical Compassionate Fund will be held at 2.30 P.M. on Friday, May 2, at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1, to elect six directors of the Fund.

The first volume of the new edition of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* appeared last October (see *Lancet*, 1957, ii, 882) and came into force at the beginning of this year. The second volume, an alphabetical index, has now appeared, and is obtainable from H.M. Stationery Office. The two volumes together cost 35*s*.

Stop morning sickness



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(PRACTITIONER, 1956 (FEB.). 176,201)

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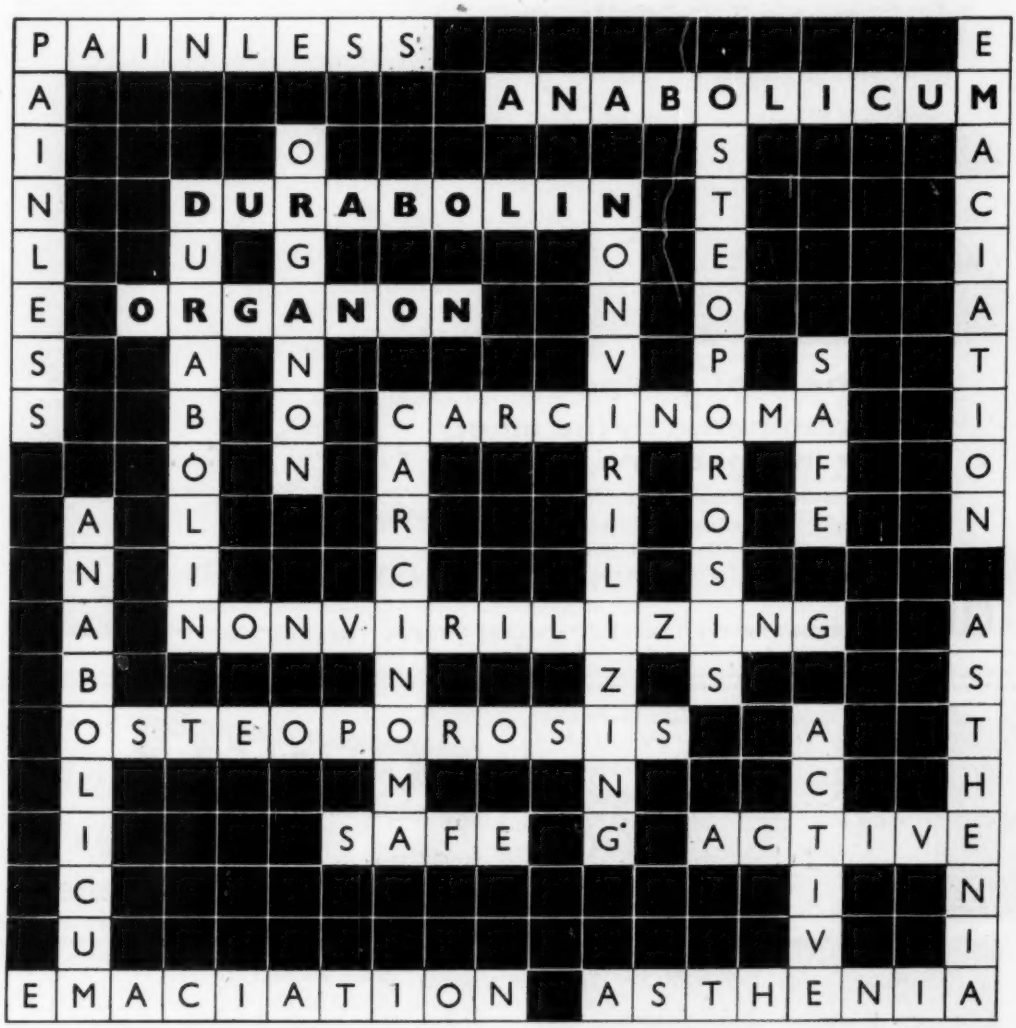

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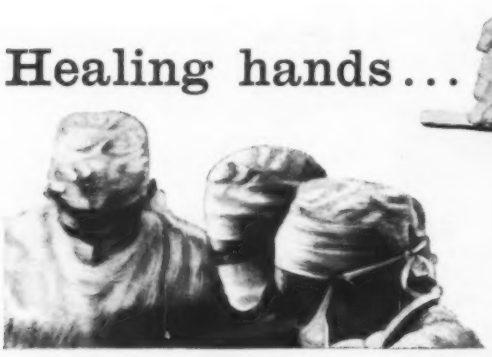

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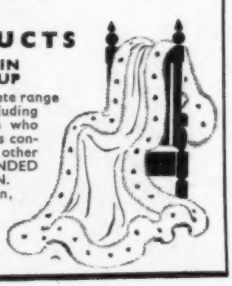

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

FACULTY OF ANÆSTHETISTS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

ANÆSTHETICS COURSE

A 2 weeks' COURSE OF LECTURES, DEMONSTRATIONS AND TUTORIALS for postgraduates preparing for higher diplomas in anæsthetics will be held from 16TH to 27TH JUNE, 1958.

Fees: Lectures and Demonstrations £15 15s.
Tutorial Discussion Groups £10 10s.

Further details and application forms may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (Tel. HOLborn 3474, ext. 23).

INSTITUTE OF ACCIDENT SURGERY

(In conjunction with the Board of Graduate Studies, The Medical School, University of Birmingham)

A COURSE IN THE ACUTE TREATMENT OF INJURIES, Birmingham Accident Hospital, 5TH–9TH MAY, 1958.

PROGRAMME

Monday, 5th May		
2 P.M.	Introduction	Mr. WILLIAM GISSANE
3 P.M.	The Open Wound ..	Mr. P. S. LONDON
Tuesday, 6th May		
10 A.M.	Burns. I	Mr. D. JACKSON
11.30 A.M.	Resuscitation of major injuries	Mr. RUSCOE CLARKE
2 P.M.	Tour of the Hospital ..	
3 P.M.	Fractures of the upper extremity	Mr. F. G. BADGER
Wednesday, 7th May		
10 A.M.	Fractures of the neck of the femur	Mr. WILLIAM GISSANE
11.30 A.M.	Internal fixation of fractures	Mr. J. H. HICKS
2 P.M.	Fractures of the shaft of the femur, dislocation of the hip	Mr. H. PROCTOR
3 P.M.	Abdominal injuries ..	Mr. RUSCOE CLARKE
Thursday, 8th May		
10 A.M.	Thoracic injuries ..	Mr. A. L. D'ABREU
11.30 A.M.	Burns. II	Mr. D. JACKSON
2 P.M.	Open fractures	Mr. F. G. BADGER
3 P.M.	Thrombo-embolism ..	Dr. S. SEVITT
Friday, 9th May		
10 A.M.	Hand injuries	Mr. P. S. LONDON
11.30 A.M.	Facio-maxillary injuries	Dr. R. WALKER
2 P.M.	Class conference.	

The fee for the Course (including lunch and tea) is 8 guineas, payable to the Institute of Accident Surgery. The course will be held partly at the Birmingham Accident Hospital and partly at the Birmingham Medical Institute, 36, Harborne-road, Edgbaston, Birmingham, 15.

Applications should be sent to and further particulars obtained from the Secretary, Institute of Accident Surgery, Birmingham Accident Hospital, Bath-row, Birmingham, 15.

UNIVERSITY OF LONDON

A LECTURE entitled "The Problem of Memory" will be delivered by PROFESSOR B. D. BURNS (McGill) at 5.30 P.M. on 21ST APRIL at the Institute of Neurology (Lecture-theatre), National Hospital for Nervous Diseases, Queen-square, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

NAPT

SYMPOSIUM ON CHRONIC BRONCHITIS. THURSDAY, 24TH APRIL, 3.30–6.30 P.M. Newcastle upon Tyne.

Tickets, including tea and sherry, 10s. each, from NAPT, Tavistock House North, London, W.C.1.

L.M.S.S.A.

FINAL EXAMINATION: MEDICINE, 12th May, 9th June, 14th July, 1958. SURGERY, 12th May, 9th June, 14th July, 1958. MIDWIFERY, 13th May, 10th June, 15th July, 1958. PATHOLOGY, 13th May, 10th June, 15th July, 1958. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries Hall, Black Friars-lane, London, E.C.4.

THE UNIVERSITY OF MANCHESTER

CHAIR OF MEDICINE

Applications are invited for the whole-time Chair of Medicine with duties and title of Director of the Department in the University and the Manchester Royal Infirmary. The Professor will be responsible for the Medical Professorial Unit in the Infirmary and will be given an honorary contract with Consultant status by the Board of Governors of the United Manchester Hospitals. The duties will begin on a date to be arranged.

Particulars of the appointment and forms of application can be obtained from the Registrar, the University, Manchester, 13, to whom they should be returned not later than 31st May, 1958.

GLASGOW ROYAL INFIRMARY

MCGHIE CANCER RESEARCH SCHOLARSHIP

Applications are invited from suitably qualified persons (not necessarily medical graduates) for the above scholarship which is now vacant. This appointment is a whole-time research appointment, and the remuneration is at the rate of £800–£1000 p.a. according to age and experience.

Applications, with names of not more than 3 referees, should be forwarded to the undersigned, from whom further particulars may be obtained. In their applications, candidates should indicate the nature and scope of their proposed research.

J. KILLOCH ANDERSON, M.B., CH.B., Medical Superintendent.
Glasgow Royal Infirmary.

GLASGOW POSTGRADUATE MEDICAL EDUCATION COMMITTEE

COURSE IN DERMATOLOGY

An intensive full-time Course of Dermatology, designed primarily for General Practitioners, will be conducted by Dr. A. GIRDWOOD FERGUSSON and his Staff in Stobhill General Hospital, Glasgow, N.1, from 23RD to 28TH JUNE, 1958.

The fee for the Course is 5 Guineas. National Health Service practitioners may, subject to certain conditions, recover the fee, locum, and travelling expenses from Government sources.

Since the number of candidates for the Course is limited, those wishing to attend should make early application to the Director of Postgraduate Medical Education, The University, Glasgow, W.2, from whom further information may be obtained.

THE BERKELEY FELLOWSHIP

(Founded in memory of the late Sir G. H. A. Comyns Berkeley and his wife, Ethel Rose Berkeley)

The Berkeley Fellowship was founded under the will of the late Sir G. H. A. COMYNS BERKELEY to provide an opportunity for research in medicine, or for visits to medical institutions or hospitals to a person elected jointly by the Master and Fellows of Gonville and Caius College, Cambridge, and the Council of the Middlesex Hospital Medical School. Under the terms of the bequest, medical centres in any part of the world may be visited, with the exception of Oxford or Cambridge.

Applications from graduates in medicine of the Middlesex Hospital Medical School are invited for the Fellowship. The period of tenure of the Fellowship and the emoluments will depend upon the circumstances of each case. A Fellowship will not normally be awarded for a period shorter than 3 months or longer than 1 year, but applications for renewal will be considered. The emolument may be paid as stipend or as grant to cover travel and other expenses necessarily incurred by the Fellow in the performance of his programme of work, or partly as stipend and partly as grant. The total emolument allowed will not normally exceed £2000 during 1 year's tenure.

Applications (6 copies) should reach the Dean of the Middlesex Hospital Medical School by 30th April, 1958, and should include the following information:—

(*a*) Name, address and age.
(*b*) Qualifications and experience.
(*c*) Present appointment.
(*d*) Programme of work proposed, with estimate of necessary expenses.
(*e*) Other sources of financial assistance, including any stipend from present appointment if continued during the tenure of the Fellowship.

NORTH LONDON POSTGRADUATE MEDICAL INSTITUTE

MEDICO-SURGICAL BRAINS TRUST, Mr. A. DICKSON WRIGHT, M.S., F.R.C.S., Dr. SHEILA SHERLOCK, M.D., F.R.C.P., in the Gymnasium of The Prince of Wales's General Hospital, London, N.15, 3.45–5 P.M., on WEDNESDAY, 30TH APRIL, 1958.

FACULTY OF ANÆSTHETISTS OF THE ROYAL

COLLEGE OF SURGEONS OF ENGLAND. Applications are invited from qualified medical practitioners of British nationality, specialising in anæsthetics, for a BURROUGHS WELLCOME FELLOWSHIP in Anæsthesia tenable at the University of California Medical Center, Los Angeles, for a period of 1 year, value $4000.

Further information may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons, Lincoln's Inn-fields, London, W.C.2.

ROYAL FREE HOSPITAL SCHOOL OF MEDICINE, Hunter-street, London, W.C.1. Applications are invited from registered medical practitioners (men or women) for appointment as (1) LECTURER IN MORBID ANATOMY from 1st October, 1958; (2) LECTURER IN MEDICAL MICROBIOLOGY from 1st July, 1958, or later by arrangement. Lecturers are also Honorary Assistant Pathologists to Royal Free Hospital; duties include teaching, research and hospital diagnostic routine. Previous experience in subject essential. Salary £1150–£100–£1750 p.a. with superannuation benefits and family allowances.

Applications, stating age, qualifications and experience, with names of 2 referees, not later than 31st May, 1958, to Secretary at above address, from whom further particulars may be obtained. (Overseas candidates must notify intention to apply by 31st May.)

UNIVERSITY OF DURHAM. The Medical School, KING'S COLLEGE, NEWCASTLE UPON TYNE. The Council of King's College invite applications for the post of TEMPORARY LECTURER in the Department of Pathology. The successful candidate will be expected to participate in the routine and research programme relating to cytodiagnosis of malignant disease as well as other work in the department. Experience in morbid anatomy histopathology is essential. Salary will be within the range £1100–£1800 according to qualifications and experience. Child allowances will be payable.

Applications (15 copies) together with the names of 3 referees, should be sent to the undersigned not later than 28th April, 1958.

G. R. HANSON, Registrar of King's College.

THE UNIVERSITY OF LIVERPOOL. Department of OBSTETRICS AND GYNÆCOLOGY. Applications are invited for the whole-time post of TUTOR IN OBSTETRICS, resident in the Liverpool Maternity Hospital. Previous resident experience in obstetrics and gynæcology is essential and higher qualifications in these subjects are desirable. The appointment will be for 1 year in the first instance, commencing 1st October, 1958. The salary will be within the range £800–£1400 p.a., according to qualifications and experience, together with board residence.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be received not later than 28th April, 1958, by the Registrar, from whom further particulars of the conditions of appointment may be obtained.

UNIVERSITY OF BRISTOL. Applications are invited for the appointment of LECTURER IN ANÆSTHETICS in the University, tenable in the United Bristol Hospitals. Salary within the scale for Clinical Lecturers, together with superannuation and children's allowances. The successful candidate will be granted an honorary contract as Consultant with the Board of Governors of the United Bristol Hospitals.

Applications (20 copies), stating age, qualifications and experience and including the names of 3 referees, should reach the undersigned, from whom further particulars may be obtained, not later than 21st April, 1958.

H. C. BUTTERFIELD, Registrar and Secretary.

UNIVERSITY OF BRISTOL. Applications are invited from medical graduates for the post of LECTURER IN BACTERIOLOGY. The duties are mainly concerned with the teaching of medical students. Lecturing experience and practical experience in virology and bacteriology is essential. Salary will be within the range of £1200–£100–£1950 together with superannuation and children's allowances.

Further particulars may be obtained from the Registrar to whom applications, with the names of 3 referees, should be sent not later than 30th April, 1958.

THE UNIVERSITY OF MANCHESTER. Applications are invited from candidates with medical qualifications registrable in this country, for the post of ASSISTANT LECTURER or DEMONSTRATOR IN PATHOLOGY. Previous experience in pathology is not essential. Duties will consist of teaching and of participation in the morbid anatomy service of Manchester Royal Infirmary. Opportunities will be available for research. Salary scales per annum attached to the posts: Assistant Lecturer, £900–£100–£1300; Demonstrator, £850–£50–£1000. Status according to qualifications and experience. Membership of Children's Allowance Scheme and, in the case of an Assistant Lecturer, of F.S.S.U.

Applications should be sent not later than 21st April, 1958, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for the Full-time CHAIR OF SURGERY. The Professor will be granted an honorary contract (in the rank of Consultant) by the Board of Governors of the United Sheffield Hospitals and will take charge of an existing clinical unit in the Royal Infirmary, Sheffield, where a special new building provides laboratory and teaching facilities.

Further particulars should be obtained from the Registrar, The University, Sheffield, 10, and applications for the Chair should reach him not later than 10th May, 1958.

UNIVERSITY OF ST. ANDREWS. Queen's College, DUNDEE. DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS. Applications are invited for the post of ASSISTANT in the Department of Pharmacology and Therapeutics, Queen's College, Dundee, in the University of St. Andrews. Salary scales: non-medical £700–£50–£850, medical £900–£100–£1100 (or £1200); appointment for 3 years with possibility of extension for fourth and final year; F.S.S.U.; family allowance.

Further particulars from the undersigned, with whom 6 copies of the application, together with the names of 3 referees, should be lodged not later than 30th April, 1958.

PATRICK CUMMING,
Joint Clerk to the University Court,
March, 1958. Queen's College, Dundee.

Hospital Services: Senior Appointments

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time CONSULTANT PHYSICIAN to the Hospital. A higher qualification in medicine is required. The successful candidate will be required to attend on not less than 3 half-days weekly.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 8th May, 1958. H. BRIERLEY, House Governor.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the Whole-time appointment of ASSISTANT CLINICAL PATHOLOGIST, paid in the salary scale of a Senior Hospital Medical Officer, at The National Hospital, Queen-square, London, W.C.1. Candidates should hold higher qualification.

Applications (36 copies), giving the names of 3 referees, must be submitted to the undersigned not later than 10th May, 1958.

H. EWART MITCHELL, Secretary to the Board of Governors.
Queen-square, W.C.1.

ST. THOMAS'S HOSPITAL, London, S.E.1. Assistant RADIOLOGIST to the X-ray Diagnostic Department. Whole-time. Salary £1653 15s.–£2126 5s. p.a.

Applications, naming 2 referees, to the Clerk of the Governors by 30th April, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Part-time CONSULTANT ANÆSTHETIST (8 notional half-days weekly) to Lichfield, Sutton Coldfield and Tamworth Group. Duties at Sutton Coldfield (3 notional half-days), Tamworth (3 notional half-days), Victoria (1 notional half-day), and Hammerwich (1 notional half-day) Hospitals, Lichfield. Experience specialty and higher qualifications required.

Applications (15 copies), stating age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Edgbaston, Birmingham, 15, by 12th May, 1958.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time or maximum Part-time CONSULTANT RADIOLOGIST for the Preston and Chorley Hospital Centre, with duties at Preston Royal Infirmary, Sharoe Green Hospital, Preston, and at Chorley and District Hospitals, &c. Appointee must reside within reasonable distance of both Preston and Chorley.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 28th April, 1958.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL, MANCHESTER, 13. SENIOR HOSPITAL MEDICAL OFFICER in Ophthalmology. Full-time, or maximum part-time, non-resident post. Previous experience in specialty essential.

Application form obtainable from F. J. CABLE, Secretary, United Manchester Hospitals, to be returned as soon as possible.

LINGFIELD HOSPITAL SCHOOL FOR EPILEPTIC CHILDREN. Applications are invited for the post of DEPUTY MEDICAL SUPERINTENDENT to commence duties in the Autumn. Neurological or pædiatric experience desirable. Mainly medical but some administrative duties. Salary according to the scale for Senior Hospital Medical Officers. A house is available at a nominal rent for a married man. Superannuable under F.S.S.N.

Applications, stating age, marital status, full particulars of qualifications and experience and names of 2 referees, to be sent to the Medical Superintendent, Lingfield Hospital School, Lingfield, Surrey.

NEWCASTLE REGIONAL HOSPITAL BOARD. Con-SULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT, whole-time, required for Prudhoe and Monkton Hospital for Mental Defectives (1143 Beds). The Hospital serves parts of the Counties of Northumberland and Durham, also the County Boroughs of Sunderland and Tynemouth, total population 933,105. Candidates must have had wide experience in psychiatry and be competent to take clinical responsibility, subject to the general administrative control of the Medical Superintendent, of a section of the Hospital and to participate in the work of the associated outpatient clinics, &c. The appointment is resident, a suitable house is available. Further particulars from Regional Psychiatrist.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, whole-time or maximum sessions, Luton and Hitchin Group of hospitals (total beds approximately 120 for obstetrics and 51 for gynæcology). The duties will be mainly obstetrical at present and the general direction of the departments will remain with the existing Consultants. Hospitals may be visited by arrangement with the Group Secretary, at St. Mary's Hospital, Luton.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, before 19th May, 1958.

OXFORD REGIONAL HOSPITAL BOARD. Assistant PSYCHIATRIST (Senior Hospital Medical Officer grade), whole-time to the Fair Mile Hospital, near Wallingford, Berkshire, and its associated clinics, as a member of the area team. Residential accommodation is available. Candidates should hold the D.P.M. or its equivalent and must have had considerable experience of psychiatry. Applicants are invited to visit the hospitals by arrangement with the Physician-Superintendent.

Applications (10 copies), stating age, qualifications, and experience, with the names of 3 referees, should reach the Secretary, Oxford Regional Hospital Board (from whom further particulars are available), 43, Banbury-road, Oxford, by 10th May.

OXFORD REGIONAL HOSPITAL BOARD. Consultant in Ophthalmology, part-time, for 7 sessions a week to the Aylesbury/High Wycombe Area Department of Ophthalmology. The apportionment of time between the 2 areas will be: 5 sessions Aylesbury; 2 sessions High Wycombe. The successful candidate will be required to reside in the Aylesbury area where his main duties will be undertaken.

Applications, 12 copies, with full details to the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, by 2nd May.

OXFORD REGIONAL HOSPITAL BOARD. Consultant in Ophthalmology, part-time, for 3 sessions a week to the Oxford/Banbury Area Department of Ophthalmology for duties at the Horton General Hospital, Banbury. The successful candidate must be prepared to live in the Banbury area.

Applications (12 copies), giving full details, to the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, by 2nd May.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time CONSULTANT BACTERIOLOGIST at the Royal Infirmary, Glasgow.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Con-SULTANT GENERAL SURGEON for 7 notional half-days per week required for the Doncaster Royal Infirmary.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 5th May, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time ASSISTANT PSYCHIATRIST for child-guidance work at the Crayford Child Guidance Clinic, Woodside-road, Barnehurst, Kent, which is administered by the Kent Education Committee. Previous experience of child guidance is essential, and possession of a higher qualification is desirable. Salary within the scale £1653 15s.–£52 10s.–£2216 5s. p.a. Applicants may visit the clinic.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 3rd May, 1958.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Whole-time Locum Tenens RADIOLOGIST for the Salisbury Group of Hospitals for 4 weeks, commencing on 26th April, 1958. Remuneration in accordance with the terms and conditions of service of hospital medical and dental staff.

Applications, stating age, qualifications and experience, and giving the names and addresses of 2 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, by 14th April, 1958.

WELSH REGIONAL HOSPITAL BOARD. Whole-time SENIOR CASUALTY OFFICER required at Caerphilly District Miners Hospital, in the Rhymney and Sirhowy Valleys Hospital Management area. Commodious family flat at reasonable rent. Salary within range of £1653 15s.–£2126 5s. Tenure of appointment for a period not exceeding 4 years.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

MELBOURNE. ST. VINCENT'S HOSPITAL. University OF MELBOURNE. Applications are invited for the position of DIRECTOR of the Clinical Biochemical Laboratories of St. Vincent's Hospital, Melbourne.

Qualifications: Medical graduate with extensive training in clinical biochemistry and expert knowledge of biochemical investigation in the problems of general medicine.

Salary: £3000 Australian with increments of £100 to £3500 Australian. Limited private practice within the Department may be allowed.

Superannuation is available. Reasonable travelling expenses will be allowed for successful applicant.

Applicants should furnish details of their nationality, age, marital status, experience and published work. 2 testimonials should be submitted and the names of 3 referees who may be consulted.

Further information may be obtained from the Chief Executive Officer and Secretary, St. Vincent's Hospital, Victoria Parade, Melbourne, N.6, Victoria, Australia.

E. W. R. GRACE, Chief Executive Officer and Secretary.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD. DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY, DUNEDIN HOSPITAL, NEW ZEALAND. Applications are invited for the position of SENIOR VISITING OBSTETRICIAN AND GYNÆCOLOGIST, Dunedin Hospital, New Zealand. Applicants must hold a higher qualification in obstetrics and gynæcology with corresponding postgraduate experience. The salary payable in accordance with the Hospital Employment (Medical Officers) Regulations is £775 p.a., and subject to appointment by the University of Otago there will be a further remuneration as a Tutor in Obstetrics. The hours of duty of the appointee will be from 7 to 10¼ hours per week, and private practice will be permitted. Conditions of appointment for the position may be obtained from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2, or the office of the High Commissioner for New Zealand, 415, The Strand, London.

Applications, on the application form attached to the conditions of appointment, stating age, qualifications and experience, together with copies of recent testimonials and health and radiological certificates, will be received by the undersigned until 10 o'clock A.M. on Monday, 2nd June, 1958.

W. A. WILLIAMSON, Secretary, Otago Hospital Board.
P.O. Box 946, Dunedin, New Zealand.

Hospital Services: Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. SURGICAL OFFICER, resident. Junior Hospital Medical Officer grade. Vacant 8th May, 1958.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. HOUSE SURGEON, resident. Vacant 18th May, 1958. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 21st April, 1958.

CHARING CROSS HOSPITAL, W.C.2. Non-resident Locum REGISTRAR in Anæsthesia required from 17th to 31st May, 1958 (inclusive). Candidates must have the D.A., and possession of the F.F.A. R.C.S. is desirable.

Application forms obtainable from the undersigned, to be returned by 26th April, 1958.

FRANK HART, Secretary to the Board.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE SURGEON required for 6 months. Post vacant 12th May, 1958. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

DULWICH HOSPITAL, East Dulwich-grove, S.E.22. (In association with King's College Hospital Medical School for teaching purposes.) SENIOR HOUSE OFFICER (anæsthetic duties), vacant from 1st May. Recognised for F.F.A. R.C.S. and D.A.

Applications, showing age, qualifications and previous posts, with names of 2 referees, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, not later than 16th April.

FULHAM HOSPITAL, St. Dunstan's-road, Hammersmith, W.6. Applications are invited for appointment as SURGICAL REGISTRAR to the Orthopædic Department (full-time, non-resident). This post offers a wide experience in orthopædic and traumatic surgery including postgraduate teaching, and is recognised for the F.R.C.S. examination. Post vacant 25th April. Candidates may visit Hospital by arrangement with the Hospital Secretary.

Applications (5 copies) to be submitted on forms obtainable from and returnable to Group Secretary, (171-L), 5, Collingham-gardens, London, S.W.5, immediately.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1 (ROYAL FREE HOSPITAL GROUP). Applications are invited from registered Women medical practitioners for the post of RESIDENT PATHOLOGIST. Salary in accordance with Ministry of Health scale for Senior House Officers. The appointment is for 6 months in the first instance. Duties to commence as soon as possible.

Applications, with copies of 3 recent testimonials, should be sent to The Secretary, Elizabeth Garrett Anderson Hospital.

HACKNEY HOSPITAL, London, E.9. (General—853 Beds.) Applications are invited from registered practitioners for the following 6-month Resident House Officer posts, now vacant:—

(*a*) CASUALTY OFFICER AND HOUSE PHYSICIAN, Skin Department.
(*b*) CASUALTY OFFICER AND HOUSE SURGEON (E.N.T.).

Apply Secretary, above address, quoting HH (*a*) or (*b*).

HACKNEY HOSPITAL, London, E.9. Applications for the Resident appointment of Locum REGISTRAR (obstetrics and gynæcology) should be sent to Secretary, above address, quoting HH/LR.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (general medicine) required. Post vacant 1st June.

Detailed applications, naming 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 23rd April.

HORNSEY CENTRAL HOSPITAL, Park-road, N.8. JUNIOR HOSPITAL MEDICAL OFFICER. Resident post offering wide experience in all branches of medicine. This is a general practitioner hospital of 60 Beds with the necessary Consultant services. The Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, 46, Cholmeley-park, N.6 (ARChway 3070, extension 527) by 22nd April, 1958.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to become vacant on Friday, 23rd May, 1958. This post is recognised for purposes of the F.R.C.S. (Eng.). Appointment will be for a period of 6 months. National Health Service salary.

Applications should reach the Secretary on or before Saturday, 26th April together with copies of 3 recent testimonials.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (Senior House Officer grade) vacant 18th April. Resident or non-resident. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with 3 testimonials, to the Hospital Secretary.

MILE END HOSPITAL, Bancroft-road, London, E.1. (479 Beds.) CASUALTY AND RECEIVING WARD OFFICER (Senior House Officer grade). Recognised for F.R.C.S. Post vacant 1st May, 1958.

Application forms, obtainable from Physician-Superintendent, to be returned by 18th April, 1958, with copies of not more than 3 testimonials.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1 (with which is associated the Institute of Cardiology). The Board of Governors invites applications for the post of REGISTRAR. Applicants should have been fully trained in general medicine and should possess a higher medical qualification. Opportunities for research available.

Applications, with copies of 3 recent testimonials, should be sent to me not later than Saturday, 19th April, 1958.

ROBERT G. E. WHITNEY, Secretary to the Board.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

REGISTRAR in Diseases of the Chest (resident), Rochford General Hospital and Lancaster House Chest Clinic, Southend-on-Sea, Essex. Experience in general medicine and special experience in diseases of the chest essential; for treatment of respiratory tuberculosis and other chest diseases.

ANÆSTHETIC REGISTRAR (resident), Bethnal Green Hospital, Cambridge Heath-road, E.2. Recognised for F.F.A. R.C.S.

ANÆSTHETIC REGISTRAR (non-resident, sleeping in on duty nights), Whipps Cross Hospital, Leytonstone, E.11. Recognised for F.F.A. R.C.S.

PÆDIATRIC REGISTRAR (non-resident), General Hospital, Southend-on-Sea, Essex. Previous pædiatric experience essential, M.R.C.P. and/or D.C.H. preferred.

REGISTRAR in Pathology (resident or non-resident), Tottenham Group of Hospitals, based at St. Ann's General Hospital, Tottenham, N.15.

MEDICAL REGISTRAR (resident or non-resident, sleeping in on duty nights), London Jewish Hospital, Stepney Green, E.1.

SURGICAL REGISTRAR (resident), Herts and Essex General Hospital, Bishop's Stortford, Herts. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 26th April, 1958.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. A vacancy occurs 1st June, 1958, for REGISTRAR in Clinical Pathology (Registrar grade). The appointment (resident) is a whole-time one and will be for 1 year in the first instance.

Applications, stating date of birth, qualifications with dates, and previous experience, together with copies of 3 testimonials, should reach the undersigned not later than 3rd May.

J. ROBBINS, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies (1 resident, 1 non-resident) occur 1st June, 1958, for HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include work in the Outpatient Department and special clinics as well as in wards. The resident post will be attached to the cardiological firm during the 4 months in London.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 3rd May.

J. ROBBINS, House Governor.

London Chest Hospital, E.2.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (third post) required to cover extra beds in process of being opened in General Medical Inpatient Department at Plaistow Hospital. Inpatient work only at present. 6 months' appointment to commence as soon as possible. Suitable for postgraduate study for higher diploma in medicine.

Apply to Hospital Secretary, giving names of 3 referees, by 26th April, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. CASUALTY OFFICER (post-registration House Officer grade) required for 6 months commencing as soon as possible.

Applications, with the names of 3 referees, to Hospital Secretary by 26th April, 1958.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Locum ANÆSTHETIC REGISTRAR (Female) required. Full or part time. 19th April.

Apply to Secretary (telephone TULse Hill 1221).

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of GYNÆCOLOGICAL HOUSE SURGEON. Vacant 23rd May, 1958. Recognised for the M.R.C.O.G.

Application forms from the Secretary.

ST. ANDREW'S HOSPITAL, Devons-road, Bow, E.3. HOUSE SURGEON required, for duties in the Ophthalmic Department and Casualty Unit; applicants must be fully registered.

Applications, with copy of at least 1 testimonial, should be sent to the Hospital Secretary immediately.

ST. GILES' HOSPITAL, Camberwell, S.E.5. Senior HOUSE OFFICER (obstetrics and gynæcology), recognised for M.R.C.O.G.

Applications, giving age, qualifications and previous obstetric and gynæcological experience, to Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22, not later than 14th April.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. SENIOR HOUSE OFFICER (orthopædic and trauma). Post recognised for F.R.C.S. Vacant now.

Applications, stating age, qualifications, experience and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address, immediately.

ST. MARK'S HOSPITAL, City-road, London, E.C.1. Applications invited from Senior Registrars who have completed their training or Registrars who have completed their appointments for the post of RESIDENT SURGICAL OFFICER. Part of time non-resident by arrangement. Salary at the rate of £1540 or £1061 10s. respectively. Appointment tenable for 6 months from 1st July with possibility further extension 6 months

Applications, stating age, qualifications, experience, names 2 referees, to Secretary, the Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 26th April.

ST. MARY'S HOSPITAL (Children's Department), PRINCESS LOUISE KENSINGTON HOSPITAL FOR CHILDREN, St. Quintin-avenue, W.10. HOUSE OFFICER required (second or third post), Medical. Vacant 1st June, 1958. Pre-registration (second post) candidates considered. Recognised for the D.C.H. The appointment will be preceded by 2 weeks' locum duties.

Applications to undersigned not later than Monday, 21st April, 1958. A. C. YOUNG, Secretary.

ST. MARY'S HOSPITAL, W.2. Registrar to the Paediatric Department at St. Mary's Hospital. Previous pædiatric experience necessary, preference given to holders of the M.R.C.P. The appointment will be for a first period of 12 months from 1st September, 1958. Successful candidate required to undertake duties in the St. Mary's Hospital Pædiatric Unit and at the constituent hospitals; may be eligible to participate in exchange scheme with Children's Medical Centre, Boston (Harvard University).

Applications, giving full details, with names and addresses of 3 referees, should reach the House Governor not later than 30th April, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the Department of Anæsthetics. For a period of 1 year in the first instance. Whole-time.

Applications, naming 2 referees, to the Clerk of the Governors by 28th April, 1958.

ST. THOMAS'S HOSPITAL, London, S.E.1. Registrar to the Children's Department. 1 year in the first instance from 18th May, 1958.

Applications, naming 2 referees, to the Clerk of the Governors by 28th April, 1958.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON, vacant 22nd May, 1958. The appointment is recognised for D.Obst.R.C.O.G.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for post of SENIOR HOUSE OFFICER (resident). Salary £819 10s. p.a. less £150 p.a. for board-residence. Post includes care of general surgical and orthopædic cases and duties in Casualty Department. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WEST LONDON HOSPITAL, Hammersmith-road, London, W.6. Whole-time NON-RESIDENT SENIOR REGISTRAR (pathology) required. Post vacant 1st May.

Applications, stating age, qualifications, experience, names 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 19th April.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of REGISTRAR in Obstetrics and Gynæcology for 1 year in first instance from 13th August, 1958.

Applications (8 copies), with names of 2 referees, to House Governor by 26th April.

WHITTINGTON HOSPITAL, London, N.19. Locum Tenens ORTHOPÆDIC REGISTRAR, non-resident, required preferably for 3 months in the first instance.

Write or call: Medical Superintendent (ARC 3070, Ext. 440).

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. Locums required:—

NON-RESIDENT MEDICAL REGISTRAR, 29th April to 5th May.

RESIDENT HOUSE SURGEON, 3rd to 18th May.

RESIDENT SURGICAL REGISTRAR, 11th to 19th June.

Apply Hospital Secretary.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE.

OBSTETRICAL HOUSE OFFICER. British Hospital for Mothers and Babies. Vacant mid-May. Recognised for M.R.C.O.G., or D.Obst.R.C.O.G.

HOUSE SURGEONS (obstetrics and gynæcology). 2 posts vacant in June. 1 at St. Nicholas Hospital, Plumstead, recognised for D.Obst.R.C.O.G., or 3 months obstetrics, 3 months gynæcology for M.R.C.O.G. 1 at Memorial Hospital, recognised for M.R.C.O.G. (6 months gynæcology). Small Obstetric Unit providing good experience.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. ABERDEEN ROYAL INFIRMARY. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Casualty Department of the Aberdeen Royal Infirmary. The post, which becomes vacant in June, is a non-resident one. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOS-PITAL, MID-WALES HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required (resident). Post recognised for F.R.C.S. examination. Vacancy from the middle of April, 1958.

Applications, stating age, experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ABERYSTWYTH. GENERAL HOSPITAL. 2 Junior HOUSE OFFICERS (1 medical and 1 surgical) required at the above Hospital.

Applications to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. Applications are invited from registered medical practitioners for the post of Whole-time ORTHOPÆDIC REGISTRAR. Post provides experience in non-pulmonary tuberculosis and general orthopædics, and includes attendances at peripheral clinics. It is recognised for 6 months' training under F.R.C.S. regulations. The post is resident for married or single persons. Canvassing disqualifies, but visit to Hospital welcomed.

Write to the Secretary for application form.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. Locum ORTHOPÆDIC REGISTRAR required probably for 2 or 3 months. Post provides experience in non-pulmonary tuberculosis and general orthopædics and includes attendances at peripheral clinics. Residence available.

Apply as soon as possible, with names of 2 referees, to the Secretary, Lord Mayor Treloar Orthopædic Hospital, Alton, Hants.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEONS (2) for Traumatic and Orthopædic Unit. 6-month appointments, suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital immediately.

BARNSLEY CHEST SERVICE. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (chest diseases) required. Single accommodation available at Wathwood Hospital. Duties at the Hospital and Barnsley Clinics under the supervision of the Consultant. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st April, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) SENIOR HOUSE OFFICER required, whose duties will be mainly casualty. The post is tenable for 1 year, and will be vacant in early June. Small furnished flat available.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARRY ACCIDENT AND SURGICAL HOSPITAL. SENIOR HOUSE OFFICER required. Unfurnished house available to rent.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. CENTRAL WIRRAL GROUP. HOUSE OFFICER (general surgery). Recognised pre-registration. Required immediately for approximately 6 months. Salary according to previous posts held.

Application forms, from Secretary, to be returned immediately.

BECKENHAM HOSPITAL, Kent. (100 Beds.) House PHYSICIAN required at above Hospital 1st May. Pre-registration post.

Apply, stating age, qualifications and experience, and naming 3 referees, to Administrative Officer.

BECKENHAM HOSPITAL, Kent. House Surgeon required at above Hospital 1st May. Recognised for F.R.C.S. Pre-registration post, with continuity for further 6 months in House Physician post, subject to satisfactory service.

Apply, stating age, qualifications and experience, and naming 3 referees, to Administrative Officer.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required for Area Laboratory. Offers experience in all branches of pathology.

Detailed applications to Group Secretary.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, Birmingham, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEON (resident). Hospital largest traumatic unit in the country and treats over 50,000 new patients each year. Recognised for purpose of casualty by R.C.S. (Eng.). Teaching programme by Consultant staff. 6-month appointment, some of which may be spent in 42-bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. RESIDENT MEDICAL OFFICER in Infectious Diseases (Senior House Officer grade). Hospital serves a wide area and gives opportunities for the study of infectious diseases, and has a poliomyelitis respiratory unit. Part of the hospital is being developed as a general hospital, where further experience can be gained.

Apply, Physician-Superintendent with 2 testimonials.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Dudley, Stourbridge and District Group, Guest Hospital, Dudley**

REGISTRAR (general medicine and geriatrics), Burton-road Hospital, Dudley (1040 Beds). Experience in specialty desirable. Higher qualifications desirable. Resident. Married accommodation can be arranged.

(2) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (pædiatrics), Sorrento Maternity Hospital and Premature Baby Unit (106 Beds). Resident preferred. Post vacant 1st June. Hospital affiliated to Birmingham University for training of medical students. Duties at other hospitals including 50 pædiatric beds at Little Bromwich General Hospital, and children's outpatient sessions. Experience children's diseases essential. Higher qualifications an advantage.

Application forms from Group Secretaries, to be returned by 21st April, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) Whole-time SENIOR SURGICAL REGISTRAR, Dudley Road group of hospitals. Duties mainly at Dudley Road Hospital (775 Beds). Resident/non-resident. Wide experience specialty and higher qualification required.

(*b*) Whole-time SENIOR REGISTRAR in Psychiatry, St. Matthew's Hospital, Burntwood (1312 Beds). Experience specialty essential.

Successful candidates may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with the arrangement for the interchange of Senior Registrars agreed between the two Boards.

Application forms from the Secretary, 10, Augustus-road, Birmingham, 15, to be returned by 28th April, 1958.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1033 equipped Beds.) ASSISTANT CASUALTY OFFICER (Senior House Officer). Resident/non-resident. Recognised for F.R.C.S.

Applications, giving qualifications, experience, age, and copies of 3 recent testimonials, should be sent to the Medical Superintendent.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT REGISTRAR in anæsthetics to the United Birmingham Hospitals. The appointment is tenable for 1 year in the first instance. Preference will be given to candidates who have passed Part I, D.A., or Primary F.F.A. R.C.S.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER in the grade of Senior House Officer, vacant 7th July, 1958, for 1 year.

Forms of application may be obtained from the House Governor and should be returned to him not later than 30th April, 1958.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). Post vacant 12th June, 1958. The post is suitable for persons training for pædiatrics or contemplating a career in pathology. The holder is expected to attend clinical rounds and meetings and to assist in the investigation of clinical problems.

Forms of application, obtainable from the House Governor, should be returned to him by 30th April, 1958.

G. A. PHALP, Secretary to the Board of Governors.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Applications invited for post of HOUSE OFFICER (surgical) (pre-registration). Salary £467 10s.–£522 10s. p.a. less £125 for residential emoluments. Appointment to commence 21st April, 1958.

Applications, stating age, nationality, qualifications and experience with copies of 2 recent testimonials or names of referees, to Hospital Secretary.

BLACKBURN. QUEEN'S PARK HOSPITAL. House PHYSICIAN required immediately. Post recognised for pre-registration purposes.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOLTON DISTRICT GENERAL HOSPITAL. (607 Beds, including 107 for obstetrics and 30 for gynæcology.) RESIDENT HOUSE OFFICER for the Department of Obstetrics and Gynæcology. Now vacant, tenable for 6 months, and recognised under the pre-registration service scheme. Also recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, should be sent to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton, not later than 18th April, 1958.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN. The appointment, which becomes vacant on 14th June, 1958, is recognised for pre-registration purposes.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the immediate appointment of SENIOR HOUSE OFFICER (resident or non-resident—orthopædics and casualty combined). The post is recognised for the F.R.C.S. examination and is normally tenable for 12 months. The Unit consists of a Registrar and 2 Senior House Officers with an additional Senior House Officer during the summer months.

Applications to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the immediate appointment of 2 HOUSE SURGEONS. The appointments are recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Hospital Secretary.

BRADFORD ROYAL INFIRMARY. Resident Senior HOUSE OFFICER (medicine and pathology). This post is of a supervisory nature in 2 acute general medical wards with a Junior House Officer, combined with duties in the Department of Pathology. Vacant now.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to the Secretary.

BRADFORD ROYAL INFIRMARY, Bradford. (507 Beds.) Locum SENIOR HOUSE OFFICER (general medicine and clinical pathology). Vacant 1st April.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Royal Infirmary, Bradford.

BRADFORD, YORKSHIRE. THE ROYAL EYE AND EAR HOSPITAL. (105 Beds.) SENIOR HOUSE OFFICER required for Ear, Nose, and Throat Department of 56 Beds. Recognised for D.L.O. and F.R.C.S. Post vacant 27th May, 1958. Salary £819 10s. p.a., less £150 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to the Secretary, Royal Infirmary, Bradford, 9.

BROMLEY HOSPITAL, Kent. Senior House Officer in charge Casualty Department required 18th May. Recognised for F.R.C.S.

Apply, stating age, qualifications with dates, previous experience, and naming 3 referees, to Administrative Officer.

BRIGHTON GENERAL HOSPITAL. Brighton and LEWES HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for General Surgical Unit (60 Beds). Vacant 25th May, 1958. Recognised for F.R.C.S. and offers considerable scope for operative surgery. Salary in accordance with national scale.

Applications, stating age, qualifications and experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON to the Orthopædic Unit. Salary in accordance with national scale. This is a pre-registration appointment.

Applications, stating age, qualifications and experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) HOUSE SURGEON required beginning of May. Pre-registration and recognised for F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer grade) required for 1 year with interchange of duties, by agreement, at the Brighton General Hospital and other specialised units within the Brighton and Lewes Group. Vacant 1st May. Post recognised for F.F.A. R.C.S., and D.A.

Applications, stating age, nationality and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (casualty and orthopædics), resident or non-resident, required at the above Hospital. Furnished or unfurnished flat available for married applicant.

Applications to Group Secretary as soon as possible.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (262 Beds.)

(*a*) SENIOR HOUSE OFFICER or HOUSE OFFICER (orthopædic and casualty duties); post recognised for F.R.C.S. (surgical); vacant late April.

(*b*) HOUSE PHYSICIAN (pædiatric and general medical duties); vacant late May.

(*c*) HOUSE PHYSICIAN (general medical duties); vacant early June.

(*d*) HOUSE SURGEON (general surgical duties), recognised for F.R.C.S. (surgical); vacant late June.

(*e*) HOUSE SURGEON (general surgical and other duties); vacant late May.

(*f*) HOUSE SURGEON (obstetric and gynæcological duties), recognised for D.Obst.R.C.O.G., vacant early July.

Except Senior House Officer, all posts recognised for pre-registration purposes.

Applications, with testimonials or names of referees, to Hospital Secretary.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN is now vacant at Stodmarsh Road Annexe. Duties include care of 30-Bedded unit of chest diseases, also work at the Chest Clinic and with the Pneumoconiosis Unit. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for:—

Black Notley Hospital, Braintree, Essex (522 Beds)

Post of HOUSE OFFICER (orthopædic surgery). Duties include care of cases from London Hospital Orthopædic Department. Pre-registration or third post, tenable for 6 months. Recognised for F.R.C.S.

Post of Locum Tenens HOUSE SURGEON. Required immediately. Pre-registration or third post. Includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S.

Harwich and District Hospital, Dovercourt, Essex (30 Beds)

Post of SENIOR HOUSE OFFICER. Duties include medical, surgical and casualty work.

St. Mary's Hospital, Pope's-lane, Colchester

Post of SENIOR HOUSE OFFICER (Resident Medical Officer) for Obstetric Unit, includes duties in connection with medical and surgical patients accommodated at hospital and duties at Essex County Hospital (general medical). Post tenable for 6 or 12 months. Resident.

Essex County Hospital, Colchester, Essex (181 Beds)

Post of HOUSE OFFICER to E.N.T. and Pædiatric Departments. Post tenable for 6 months. Post-registration appointment. Recognised for D.L.O. The Pædiatric Department consists of a new unit of 24 Beds.

Post of Locum SENIOR HOUSE OFFICER (anæsthetics) required from 20th May for approximately 2 months.

Applications, with copies of 3 testimonials, to Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, CARDIFF. There will be a vacancy for a SENIOR HOUSE OFFICER early in April in this Hospital, which has 240 Beds for the treatment of tuberculosis—both pulmonary and non-pulmonary—and allied chest conditions. Experience available in thoracic surgery and operative treatment of bone and joint, genitourinary, and glandular tuberculosis.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) in Obstetrics and Gynæcology required from 1st May, 1958. Duties initially at Cardiff Isolation Hospital (Gynæcology) then at St. David's Hospital (Maternity). Recognised for M.R.C.O.G.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the post of SENIOR REGISTRAR or REGISTRAR in the Department of Physical Medicine in this teaching group, where there are opportunities for postgraduate study.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of REGISTRAR to the Whole-time Medical Professorial Unit at the Cardiff Royal Infirmary. Non-resident appointment, to commence as soon as possible.

Application forms may be obtained from the Secretary, Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical).

Applications, stating age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Group Medical Superintendent.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer (intern) grade). 100 orthopædic beds. Post recognised for F.R.C.S. and pre-registration service. Salary in accordance with terms and conditions of National Health Service. Post vacant 21st April, 1958.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, Surrey.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months' appointment. National salary scales for either provisionally or fully registered practitioners. Post approved for pre-registration practitioners and F.R.C.S. 8 residents. Vacant 8th May.

Applications, stating age, experience, qualifications with references or names of referees, to Senior Administrative Officer.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (general surgery) or HOUSE SURGEON (pre-registration). Resident. Appointment from 1st June for 6 months. Recognised for F.R.C.S.

Applications, stating full details and 2 names for reference, to Secretary.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL, Healds-road. (304 Beds.) The pre-registration appointment of HOUSE OFFICER (general surgery) is now vacant.

Applications, with full details, should be sent to the Administrative Officer at the Hospital.

DEWSBURY. THE GENERAL HOSPITAL, Moorlands-road. (128 Beds.) The pre-registration appointment of HOUSE OFFICER (general medicine and dermatology) falls vacant on 30th April, 1958.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Applications are invited for the post of HOUSE SURGEON (Intern or Senior House Officer). Post recognised for F.R.C.S. Vacant early May.

Applications, with particulars of experience and copies of 2 recent testimonials, to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (330 Beds. Recognised for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required, 17th June, 1958. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st April, 1958, giving age, nationality, qualifications, present and previous appointments, with dates, naming 3 referees.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Corbett Hospital, Stourbridge (114 Beds)

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (surgical). Post vacant now.

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

Burton Road Hospital, Dudley (1040 Beds)

HOUSE OFFICER or SENIOR HOUSE OFFICER according to experience (general medicine and geriatrics). Resident. Married accommodation can be arranged.

Applications, naming 2 referees, to Group Secretary, Guest Hospital, Dudley, Worcs.

DUNDEE. MARYFIELD HOSPITAL. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in an acute Geriatric Unit (59 Beds) for assessment and rehabilitation and long-term unit (56 Beds) supervised by a Consultant specialising in geriatrics in a Teaching Hospital. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and other illnesses of the elderly.

Applications, stating qualifications and names of 2 referees, to the Medical Superintendent.

DUNDEE. MARYFIELD HOSPITAL. Applications are invited for the post of RESIDENT HOUSE OFFICER in an acute Geriatric Unit (59 Beds) for assessment and rehabilitation and long-term unit (56 Beds) supervised by a Consultant specialising in geriatrics in a Teaching Hospital. The appointment offers excellent clinical experience in the diagnosis and treatment of acute and other illnesses of the elderly. Recognised for pre-registration.

Applications, stating qualifications and names of 2 referees, to the Medical Superintendent.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology, West Norfolk and King's Lynn General Hospital (146 Beds). Post recognised for D.Obst.R.C.O.G. Single quarters available. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 21st April, 1958. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR MEDICAL REGISTRAR, Ipswich and West Suffolk Hospital. Applicants should have good experience in general medicine and a higher qualification. It is probable that the final year in post will be occupied on secondment to a teaching hospital in London.

Applications, stating age, experience and names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 28th April, 1958. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary, Ipswich and East Suffolk Hospital, Anglesea-road Wing, Ipswich.

EAST GRINSTEAD. QUEEN VICTORIA HOSPITAL. RESIDENT HOUSE OFFICER (Male or Female), Locum or permanent appointment, required immediately for General Hospital. Appointment for 6 months in first instance; recognised for pre-registration purposes, and for F.R.C.S. examination.

Apply, stating age and experience, with names of 3 referees, to Hospital Secretary.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. 2 OBSTETRIC HOUSE SURGEONS for above Hospital. Posts vacant 9th and 23rd May, 1958. 6 months' appointments. Posts recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications and experience, and enclosing copies of up to 3 recent testimonials, to Medical Administrator of Hospital by 25th April, 1958.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON—third post. Vacant immediately. Post provides experience and duties in general surgery and orthopædics. 6-month appointment. Post recognised for F.R.C.S.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON, pre-registration post. Vacant 11th May, 1958. Duties with General Surgical Unit, doing some genitourinary work. Post recognised by the Royal College of Surgeons. 6 months' appointment.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (anæsthetics) required. Resident. Post vacant early May. Busy general hospital; easy access to London. Good experience. Post recognised for D.A.

Applications, with copies of recent testimonials, to be sent to the Group Secretary, Epping Group Hospital Management Committee, Oak Cottage, The Plain, Epping, Essex, by 24th April.

EXETER. WEST OF ENGLAND EYE INFIRMARY. (62 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in Ophthalmology. Resident or non-resident. The post is recognised for the F.R.C.S. examination and is vacant on 1st June, 1958.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 26th April, 1958.

GLASGOW, N.1. FORESTHALL HOSPITAL. (600 hospital beds for long-term sick.) JUNIOR HOSPITAL MEDICAL OFFICER. Applicants must have been qualified for 2 years and have had experience as House Officers in general hospitals. The present establishment is for 5 Junior Hospital Medical Officers and they are encouraged to spend part of their time at a nearby teaching hospital to maintain their interest in general medicine. Facilities and supervision are also provided for medical officers wishing to pursue clinical research in preparation for higher degrees. Living-in optional.

Applications, with the names of 3 referees, should be sent to the Administrative Medical Officer, Foresthall, 657, Edgefauld-road, Glasgow, N.1.

GRAVESEND AND NORTH KENT HOSPITAL, Gravesend, Kent. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Locum ORTHOPÆDIC REGISTRAR required now for 3–4 weeks. Salary £19 5s. per week.

Applications to Hospital Secretary (Telephone Gravesend 274).

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (239 Beds.) GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL REGISTRAR (resident) at above Hospital, which may be visited by arrangement direct.

Application forms from Group Secretary, Guildford Group Hospital Management Committee, St. Luke's Hospital, Guildford, to whom they should be returned by 26th April, 1958.

HALIFAX. NORTHOWRAM HALL HOSPITAL. (108 Beds.) SENIOR HOUSE OFFICER in Chest Diseases required. Post vacant, mid-April, 1958. Duties include attendance at busy Chest Clinic at the Royal Halifax Infirmary and non-tuberculous chest ward work. This post offers excellent facilities for the study of chest diseases and experience is available with bronchoscopies and bronchograms. Salary £819 10s. p.a., with a deduction of £150 p.a. for board residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE PHYSICIAN required. Pre-registration post vacant 2nd May. Staff of 5.

Applications to Hospital Administrator.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE SURGEON required. Pre-registration post, recognised for F.R.C.S. Modern theatre. Staff of 5.

Applications to Hospital Administrator.

HASTINGS AND ST. LEONARDS-ON-SEA. BUCHANAN HOSPITAL. (91 Beds.) Locum SENIOR HOUSE OFFICER (obstetrics) required 14th–27th April inclusive. Salary £15 19s. a week, less board.

Apply, with names of 2 referees, to Hospital Administrator.

HAROLD WOOD, ESSEX. Area Laboratory, Harold Wood HOSPITAL. Applications are invited for Locum REGISTRAR. Post now vacant. Accommodation available if required.

Applications to Area Pathologist, from whom further details may be obtained.

HAREFIELD HOSPITAL, Harefield, Middlesex. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) for duties on the Thoracic Surgical Unit.

Applications, together with copies of 2 testimonials, to be sent to the Medical Director, Harefield Hospital, Harefield, Middlesex, by 24th April, 1958.

HENLEY-ON-THAMES, OXFORDSHIRE. PEPPARD CHEST HOSPITAL. (236 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER, vacant 13th April, 1958. The Hospital deals with all types of chest disease in medical and surgical wards. Previous experience in resident hospital appointments is desirable. Single accommodation is available.

Applications, stating age, qualifications and experience, with the names of 2 referees, should be forwarded to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 1st May, 1958. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin.

HOLT, NORFOLK. KELLING HOSPITAL AND DEPARTMENT OF THORACIC SURGERY. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER, vacant now. This Hospital (180 Beds) deals with tuberculous and non-tuberculous chest conditions and offers excellent experience in chest medicine and thoracic surgery. Married accommodation available.

Applications, stating age, sex, qualifications, nationality and experience, together with names of 2 referees, to the Group Secretary, Cromer Area Hospital Management Committee, Cliff-avenue, Cromer, Norfolk, who will be pleased to supply any other information concerning the appointment.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (235 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade) at the above Hospital, to commence duties immediately. The duties will be mainly surgical, in a hospital which caters for chronic sick, children, maternity, and acute medical and surgical patients. Salary in accordance with the terms and conditions of service for hospital medical and dental staff, £819 10s. p.a.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON,
Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), vacant on 15th April. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) Resident SENIOR HOUSE OFFICER (surgical) required for Major Thoracic Surgical Unit at the above Hospital.

Applications, stating age, nationality, qualification and experience, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Locum Tenens SENIOR HOUSE OFFICER to the Fracture and Orthopædic Department required from 1st to 20th May, 1958.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH. Pre-registration post of HOUSE SURGEON to General Surgeon vacant. Recognised for R.C.S. examination.

Applications, with copies of recent testimonials, to Hospital Secretary.

KETTERING AND DISTRICT GENERAL HOSPITAL, NORTHAMPTONSHIRE. Applications are invited for the post of Locum HOUSE SURGEON (pre-registration), from 1st April for 2 months. Post recognised for F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KING'S LYNN. WEST NORFOLK AND KING'S LYNN GENERAL HOSPITAL. (146 Beds.) Applications are invited for the post of HOUSE OFFICER (medicine) (post recognised for pre-registration). Appointment will be for 6 months in the first instance. Post vacant end of April. 9 residents employed. The post offers valuable experience in acute medical, ophthalmic and chest work.

Applications, with names and addresses of 2 referees, to be forwarded to the Group Secretary, King's Lynn Area Hospitals Management Committee, St. James' Hospital, Extons-road, King's Lynn, Norfolk.

LIVERPOOL REGIONAL HOSPITAL BOARD. WHISTON HOSPITAL. Applications are invited for the post of whole-time Locum Tenens ANÆSTHETIC REGISTRAR (resident) with duties at the above Hospital. The post is tenable immediately and the appointment will be for a period of approximately 3 months.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 19th April, 1958.

VINCENT COLLINGE, Secretary to the Board.

LANCASTER. ROYAL LANCASTER INFIRMARY. (240 Beds.) RESIDENT HOUSE OFFICER (surgical). Pre-registration post. Successful applicant will work with Consultant Surgical Unit and attend consultative clinics. Post tenable for 6 months. Recognised for F.R.C.S.

Applications, with names of 2 referees, to the Secretary, Royal Lancaster Infirmary, Lancaster.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies

Anæsthetics

Leeds (A) and (B) Groups. Recognised for F.F.A. R.C.S. and D.A. Resident or non-resident.

Ophthalmology

Huddersfield Group (23 eye beds and 1500 new outpatients annually). Non-resident.

Psychiatry

Storthes Hall Hospital, Huddersfield. (2750 Beds.) Facilities for attendance at the Leeds University will be provided if the successful candidate is studying for the D.P.M.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 16th April, 1958.

LLWYNYPIA HOSPITAL, Llwynypia, Rhondda. PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Medical) at the above Hospital. A house is provided with fuel, light, water and laundry services at a rental to be determined. An appropriate charge will be made for the use of any furniture. The person appointed will be required to undertake duties at the Llwynypia Hospital (40 acute medical beds and 78 chronic sick beds), Glyncornel Hospital (56 chronic sick beds) and Tyntyla Isolation Hospital (42 Beds).

Further particulars may be obtained from the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd, to whom applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent as soon as possible.

MACCLESFIELD HOSPITAL (Infirmary Branch). House OFFICER or Pre-registration HOUSE OFFICER in Surgery. Acute Surgical Unit of 100 Beds. Recognised for F.R.C.S. purposes. Main casualty duties undertaken by Senior Resident Practitioner.

Apply immediately to Group Secretary, Macclesfield and District Hospital Management Committee, Willerby House, Cumberland-street, Macclesfield.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON, 6 months' appointment. Vacant now. Recognised for F.R.C.S. Salary at the rate of £467 10s.–£577 10s. p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool. There are 65 orthopædic beds in the group and busy outpatient clinics. Ample scope for gaining experience in all aspects of the work of the department. Post recognised for F.R.C.S. examination and vacant from 1st June, 1958. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, qualifications, experience and the names and addresses of 3 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in General Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool (354 Beds). The post, which is vacant on 3rd July, 1958, is recognised under the F.R.C.S. regulations. The appointment offers an excellent opportunity to suitably qualified candidates for gaining practical experience in general and emergency surgery. A furnished flat is available in the married quarters situated in a detached property in a select residential area adjacent to the Hospital.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Group Department of Clinical Pathology, to commence early in June, 1958. Whole-time non-resident post, tenable for 12 months, renewable, primarily intended for the training of pathologists. Previous laboratory experience desirable.

Application form obtainable from the Secretary, to be returned not later than 20th April, 1958.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (Obstetrics and Gynæcology) becoming vacant on 8th May, 1958. The Hospital takes part in undergraduate medical teaching, and the post is recognised in obstetrics and gynæcology for M.R.C.O.G. purposes.

An application form should be obtained from the Group Secretary at the Hospital and returned within 14 days of the appearance of this advertisement.

MORECAMBE. QUEEN VICTORIA HOSPITAL. Resident SENIOR HOUSE OFFICER (surgical). The post is normally tenable 1 year and the successful applicant will be attached to the specialist surgical unit.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Royal Lancaster Infirmary, Lancaster.

MALVERN. ST. WULSTAN'S HOSPITAL. (230 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Good experience in modern treatment of pulmonary tuberculosis and other chest diseases.

Applications to the Physician-Superintendent.

MIDDLESBROUGH GENERAL HOSPITAL. Ayresome Green-lane, MIDDLESBROUGH. (305 Beds.) TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics) at the above Hospital. The post is recognised for the F.R.C.S. examination and will include some duties in the Casualty Department, which is under the supervision of a full-time Senior Casualty Officer.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be sent to the Hospital Secretary.

MIDDLESBROUGH GENERAL HOSPITAL, Ayresome Green-lane, MIDDLESBROUGH. (305 Beds.) TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE OFFICER (orthopædics) at the above Hospital. The post is recognised for pre-registration service under the Medical Act, 1950, and includes some duties in the Casualty Department which is under the supervision of a full-time Casualty Officer.

Applications, stating full details and giving 2 names for reference, should be sent to the Hospital Secretary.

MIDDLESBROUGH (near). HEMLINGTON HOSPITAL. TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (surgery) at the above Hospital. This post offers experience in acute surgery, gynæcology, and plastic surgery.

Applications, stating age, qualifications and names for reference to be forwarded to the Hospital Secretary.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (medical) required for above Hospital situated on Great North-road, approximately 20 miles from Nottingham. Post offers good experience. Consultant staff attending Newark Hospital are on 1 or more of the Nottingham Hospitals. Flat available as married quarters. Salary and conditions of service in accordance with Ministry regulations. Duties to commence about 29th April, 1958.

Applications, giving names of 3 referees, should be sent to Group Secretary, Nottingham No. 1 Hospital Management Committee, General Hospital, Nottingham.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the temporary appointment of ASSISTANT RESIDENT MEDICAL OFFICER at the Royal Victoria Infirmary from the middle of April, 1958. The appointment will be subject to the terms and conditions of service of hospital medical staff in the National Health Service, and the salary will be that for a Locum Senior House Officer (£15 19s. per week) with appropriate deductions for residential emoluments.

Applications, giving full details and the names and addresses of 2 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time appointment of SENIOR REGISTRAR in the Department of Anæsthetics. The post, which is non-resident except for rotational emergency duty, offers certain facilities for laboratory and clinical investigation. Applicants should have had considerable experience in anæsthesia and should hold the F.F.A. R.C.S. or the D.A. The appointment is subject to terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full particulars and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWTON ABBOT HOSPITAL. (General section, 65 Beds.) RESIDENT SENIOR HOUSE SURGEON, Male or Female, required approximately end May, 1958. Married quarters available.

Applications, quoting Ref. F.364/40, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, South Devon.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR required for Centre for Plastic Surgery at above Hospital. The post is an annual one and is subject to confirmation at the end of the first 6 months. Applicants must have had very good general surgical experience, and an interest in research is desirable. The Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 29th April, 1958.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Recognised for training for M.R.C.O.G. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st April, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM EYE HOSPITAL. Senior House Officer required, duties to commence mid-April, 1958. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Thoracic Surgery at Peppard Chest Hospital, near Reading, for an initial period of 1 year. (236 Beds, including 60 for surgical cases.) The special surgical unit contains 34 Beds. Married or single accommodation available.

Application forms, obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 25th April.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Anæsthetics to the Banbury Hospitals. Vacant now. Recognised for F.F.A. R.C.S. The appointment is for 1 year in the first instance and eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrars Committee, 43, Banbury-road, Oxford, should reach him by 2nd May.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the post of RESIDENT JUNIOR PATHOLOGIST for 6 months at the Radcliffe Infirmary and Churchill Hospital, Oxford. The post is graded at Senior House Officer rate, £819 10s. p.a., and will be vacant with effect from 12th May, 1958.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 18th April, 1958.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. AREA PATHOLOGICAL DEPARTMENT. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER in pathology. The post is recognised for non-university experience for D.Path., Royal College of Physicians and Surgeons. The appointment will be for a period of 12 months, in the Area Laboratory at the South Devon and East Cornwall Hospital, Greenbank-road, Plymouth, which provides excellent modern working facilities.

Applications, stating age, nationality, qualifications and experience, together with the names and addresses of 3 referees, to be sent as soon as possible to Group Secretary, 7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, FREEDOM FIELDS. Central Casualty Department. RESIDENT SENIOR HOUSE OFFICER in Casualty, vacant immediately. Recognised for the F.R.C.S.

Applications, with names of 3 referees, to be sent to the Group Secretary.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. SENIOR HOUSE OFFICER in Medicine, vacant 11th June, 1958.

Applications, with names of 3 referees, to Group Secretary, 7, Nelson-gardens, Devonport.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road. HOUSE SURGEONS, pre-registration posts, vacancies 1st and 6th June, also 1st July, 1958. Recognised for the F.R.C.S.

Applications, with full particulars, to the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(1) **Saint Mary's Hospital**

HOUSE SURGEON (pre-registration). Vacant now (2 posts).

(2) **Royal Portsmouth Hospital**

(*a*) HOUSE SURGEON (pre-registration). Vacant now.

(*b*) SENIOR HOUSE OFFICER required in Orthopædic Department (104 Beds). Vacant now.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH. QUEEN ALEXANDRA HOSPITAL. (87 acute surgical beds.) PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SURGICAL REGISTRAR at above Hospital. Vacant 24th June, 1958. Prefer holder of post be resident.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, Saint Mary's Hospital, Milton, Portsmouth, which should be returned to him duly completed on or before 14th April, 1958. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Group Secretary.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL. REGISTRAR in Anæsthetics. Full-time resident appointment, married quarters available, vacant 1st May. Recognised for D.A. and F.F.A. R.C.S.

Application forms from Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Pendleton-road, Surrey, returnable by 26th April.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL. Locum REGISTRAR in Anæsthetics required from 24th April for 4–6 weeks pending filling of 2-year appointment.

Apply to Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Pendleton-road, Redhill (Telephone Redhill 3581, extension 20).

READING. BATTLE HOSPITAL. (391 Beds.) Reading AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (pre- or post-registration) required in the Accident and Orthopædic Department. F.R.C.S. recognised. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with copy of recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT ASSISTANT PATHOLOGIST (1 of 2), vacant on 15th April, 1958, and tenable for 6 months. Salary £577 10s. p.a.

Write, stating age, qualifications with dates, nationality and present post, with copies of 2 recent testimonials, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (397 Beds.) Applications are invited from registered and provisionally registered medical practitioners for resident post of HOUSE SURGEON, vacant 9th April, 1958, and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING COMBINED HOSPITALS. Area Department OF OBSTETRICS AND GYNÆCOLOGY. (100 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the resident post of GYNÆCOLOGICAL HOUSE SURGEON at the Royal Berkshire Hospital, Reading. Vacant 8th April, 1958, and tenable for 6 months. Post recognised for M.R.C.O.G.

Write, stating age, qualifications with dates, nationality and present post, with copy of 1 recent testimonial, to Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE OFFICER in Pædiatrics with general medicine, at the above Hospital. Post vacant 16th April, 1958.

Applications, stating age and experience, with copies of 2 testimonials, to be sent to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. RESIDENT MEDICAL OFFICER (Registrar grade), post vacant 1st May, 1958, at Birch Hill Hospital, Rochdale.

Apply as soon as possible, with names and addresses of 2 referees, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. BIRCH HILL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology) required immediately. The post is for 6 months in the first instance and is recognised for the D.Obst.R.C.O.G.

Apply, with names and addresses of 2 referees, to the Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHESTER, KENT. ST. BARTHOLOMEW'S HOS-PITAL. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade) (1 of 2 in the department). Post vacant now and tenable for 6 months or 1 year. Recognised for F.R.C.S. Salary £819 10s. p.a.

Applications, stating age, nationality, qualifications and experience, with recent testimonials, to Hospital Secretary.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. Not pre-registration appointment.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required from 21st April, 1958. Not pre-registration appointment.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

REGISTRAR in Medicine based at the Royal Infirmary, Glasgow.

REGISTRAR in Psychiatry based at Riccartsbar Mental Hospital, Paisley, Renfrewshire.

REGISTRAR in Psychiatry based at Bellsdyke Mental Hospital, Larbert.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 19th April, 1958.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS BOARD OF GOVERNORS AND SHEFFIELD REGIONAL HOSPITAL BOARD. Reciprocal Training Scheme for Senior Registrars. Whole-time SENIOR REGISTRAR in Anæsthetics required with initial tenure of appointment at Nottingham City Hospital (811 Beds). Duties also at other hospitals in the Nottingham Area. Possession of a higher qualification desirable. Appointment for 1 year in first instance and renewable thereafter annually. Successful candidate will be transferred to the Teaching Hospitals for the second phase of the appointment in accordance with arrangements under the Reciprocal Training Scheme. Renewal of appointment and transfer will be subject to satisfactory work and progress.

Further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 21st April.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY. Applications invited for the post of OPHTHALMIC REGISTRAR at the above Hospital. Post vacant 1st June.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 19th April, 1958, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEPPEY GENERAL HOSPITAL, Minster, Sheppey. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN. Applications are invited for this pre-registration post, vacant now. Salary £467 10s.–£577 10s. p.a. according to experience.

Applications, stating age, qualifications, and experience, to be addressed to the Hospital Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) HOUSE SURGEON. Vacant 23rd April, 1958. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON. Vacant 1st May, 1958. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SOUTHAMPTON GENERAL HOSPITAL. (469 Beds.) RESIDENT HOUSE PHYSICIAN required. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds. Recognised for F.R.C.S.) ORTHOPÆDIC HOUSE SURGEON (post recognised for pre-registration service and tenable for 6 months). The Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Psychiatric registrars training scheme. Applications are invited for the appointment of REGISTRAR for 6 months' periods at the hospitals of St. Ebba's, Horton, Long Grove and The Manor in succession. Wide experience is available in all forms of psychosis, in neurosis and in mental deficiency under modern methods of treatment. Special experience may be gained in the Mott Clinic for General Paralysis, St. Ebba's Juvenile Unit and in Mapother House, Long Grove, for acute psychosis; also in the associated observation wards and Outpatient Departments. The appointment will be tenable from July, 1958. Salary, &c., in accordance with the agreed terms and conditions of service of hospital medical staff. For residents appropriate charges are made for full residential amenities. Candidates may visit the hospitals by appointment with the Physicians Superintendent.

Application forms may be obtained from the Group Secretary, St. Ebba's and Belmont Group Hospital Management Committee, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

STAFFORD. ST. GEORGE'S HOSPITAL. Senior House OFFICER and HOUSE OFFICER (resident) required. The posts offer experience in all branches of psychiatry, outpatient work, medical psychology, psychosurgery, &c. The Hospital (1238 Beds with separate unit for private patients) has a high admission-rate and is recognised for training for D.P.M., a Course for which may be taken at the University of Birmingham.

Applications, with names of 2 referees, to Medical Superintendent.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 surgical teams. Post recognised for F.R.C.S. Post vacant 16th April, 1958, and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid Herts. Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required for duties mainly in the Pædiatric Department. Post vacant approximately 20th April, 1958, and tenable for 6 months. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ASAPH GENERAL HOSPITAL, St. Asaph. (201 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required at the above Hospital. Post vacant 1st May, 1958. Married quarters available if required.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to be sent forthwith to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhianfa, Russell-road, Rhyl, Flintshire.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (815 Beds.) HOUSE OFFICER (general surgery) required. Vacant shortly. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to the Secretary at the Hospital.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. Applications invited for HOUSE OFFICER (medical), vacant shortly. Recognised pre-registration post.

Detailed applications to the Secretary at the Hospital.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. SENIOR HOUSE OFFICER (obstetrics and gynæcology) required. Post vacant during May. Recognised D.Obst.R.C.O.G.

Detailed applications to Hospital Secretary as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics) required. Post recognised for F.F.A. R.C.S. and D.A. Medical library facilities available.

Detailed applications to Hospital Secretary as soon as possible.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. The post is recognised under the F.R.C.S. regulations for 6 months' casualty training. It offers exceptional experience in all aspects of traumatic surgery as occurring in a large industrial centre and port.

Applications, stating age and experience together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

STOCKPORT INFIRMARY. (163 Beds.) Applications are invited for the post of HOUSE OFFICER (general surgery), vacant 7th April, 1958. This is an approved pre-registration post and is recognised for the F.R.C.S.

Applications, with copies of 2 testimonials, to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for the Unit of Obstetrics and Gynæcology. Vacant 18th May. Post recognised for M.R.C.O.G.

Applications, stating age and qualifications with dates, together with copies of 2 testimonials, to Secretary.

TORQUAY. TORBAY HOSPITAL. Senior Resident HOUSE OFFICER (medicine) required end April, 1958. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, age, nationality, with copy testimonials (quoting reference F.955/90), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (211 Beds.) CASUALTY OFFICER (Senior House Officer) required. Modern Department employing 3 full-time Casualty Officers including whole-time Surgeon-in-charge. Post recognised for F.R.C.S. Resident or non-resident. Post vacant beginning of May.

Please send applications, with copies of 2 references, to the Administrator.

WEST FIFE HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) (resident) at the Dunfermline and West Fife Hospital. The appointment will be for the period of 1 year in the first instance and the person to be appointed will be expected to take up duties about 23rd June, 1958. The Dunfermline and West Fife Hospital is a busy general surgical unit, recognised by the Faculty of Anæsthetists, and offers wide scope for experience and training. The appointment carries certain duties at the Maternity Hospital. Salary and conditions of service in accordance with Whitley Council agreements.

Applications, together with the names of 3 referees, should be lodged with the Surgeon-Superintendent, not later than 15th May.

WEYMOUTH AND DISTRICT HOSPITAL. (124 Beds.) HOUSE SURGEON (Male or Female) required for resident pre-registration post. Recognised for F.R.C.S. examination and tenable for 6 months.

Applications, stating age, qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR, resident, required at Royal Albert Edward Infirmary, Wigan. Preference given to holders of higher surgical qualifications. Post recognised for F.R.C.S.

Apply, with names of 2 referees, to Secretary, Royal Albert Edward Infirmary, Wigan.

WINCHESTER AND LORD MAYOR TRELOAR GROUPS. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Anæsthetics (Registrar grade) required at Alton General Hospital, with duties at Lord Mayor Treloar and Henry Gauvain Hospitals, Alton, and Royal Hampshire County Hospital, Winchester. Post recognised for the F.F.A. R.C.S., and is resident or non-resident. Vacant 12th May, 1958.

Forms of application obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (327 Beds.) HOUSE PHYSICIAN (pre-registration) to the Pædiatric Department. Vacant mid-April. Preference will be given to applicants wishing to specialise in pædiatrics. The Department is recognised for the D.C.H.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (327 Beds.) HOUSE SURGEON to the Senior Surgeon. Post vacant end April.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (327 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant mid-April.

Applications, with copies of 2 testimonials, to Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN required, Male or Female, for post vacant 18th May. Pre-registration post.

Applications, stating age, qualifications with dates, nationality, and copies of 3 recent testimonials, to Secretary, as soon as possible.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) SENIOR HOUSE OFFICER (general surgery). Post vacant immediately.

Apply, giving age and qualifications, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) ORTHOPÆDIC SENIOR HOUSE SURGEON for Fracture and Orthopædic Department. Post recognised for F.R.C.S. Vacant immediately.

Apply, with 2 testimonials, to the Secretary.

YORK. COUNTY HOSPITAL. (266 Beds. General.) Resident Pre-registration HOUSE OFFICER (general medicine) required. Post is vacant now and is tenable for 6 months.

Applications, giving names of 2 referees or 2 copy references, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York, immediately.

YORK. COUNTY, CITY, MILITARY (Civilian Wing) and FULFORD HOSPITALS. (General hospitals of 266, 256, 60, and 149 Beds respectively with full Consultant staff.) SENIOR HOUSE OFFICER in Anæsthetics, resident or non-resident, required. Post is recognised for F.F.A. R.C.S. and D.A. Previous experience desirable but not essential.

Applications immediately, stating age, nationality, qualifications, experience and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

DUBLIN. ROYAL VICTORIA EYE AND EAR HOSPITAL. E.N.T. Department. HOUSE SURGEON for above department required. Appointment for 1 year from 1st July, 1958. Salary £275 p.a. with free board, lodging and laundry.

Applications, with testimonials, to be forwarded to the Registrar before 30th April, 1958.

CANADA. VICTORIA HOSPITAL, London, Ontario, CANADA. 800-Bedded Hospital associated with Medical School has vacancies for JUNIOR ROTATING INTERNS on or about 15th June, 1958. Approved training by Royal College for 10 specialties. Appointment 1 year with honorarium of $100 per month. Room, board, and laundry provided.

Applications, with letters of reference, to Superintendent.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 year approved ROTATING INTERNSHIP beginning 1st July, 1958. 234-Bed General Hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Salary $200 if single, $250 if married. Housing rent-free.

Apply Director.

U.S.A. BEVERLY HILLS SANITARIUM, 210 N. Westmoreland, DALLAS 11, TEXAS, U.S.A. Required, HOUSE PHYSICIAN for 120-Bed private psychiatric hospital. Salary $400–$500 per month. Post vacant 1st July, 1958.

Immediate reply, with full details requested, to be sent to Medical Director.

U.S.A. BRIDGEPORT HOSPITAL, Bridgeport, Connecticut. Approved ROTATING INTERNSHIPS and RESIDENCIES available in a general hospital of 387 Beds and 60 Bassinets. Stipend of $190 per month in addition to full maintenance and uniforms. Exchange Visitor Program participant.

Address inquiries to: Chairman, Committee on Medical Education, Bridgeport Hospital, Bridgeport 10, Connecticut, U.S.A.

U.S.A. NORTON MEMORIAL INFIRMARY, Louisville, KENTUCKY, U.S.A. A 290-Bed general hospital, approved by the American Medical Association for ROTATING INTERNSHIPS of 1-year duration. Approved under Exchange Visitor Program. Only graduates from approved medical schools considered. Rotating services in medicine, surgery, obstetrics and pædiatrics. Stipend $200 per month, and full maintenance for bachelors.

Apply airmail to Administrator.

U.S.A. UNIVERSITY OF MINNESOTA MEDICAL CENTER. ANESTHESIOLOGY RESIDENCIES at the above Center. 2 or 3-year programme with clinical and didactic instruction in all phases of anæsthesia. Board approval. Positions starting every month.

Address, F. H. VANBERGEN, M.D., University of Minnesota Medical Center, Minneapolis 14, Minnesota.

Public Appointments

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications are invited from registered medical practitioners for post of ASSISTANT ADMINISTRATIVE MEDICAL OFFICER OF HEALTH (Male or Female). Candidates should hold the Diploma of Public Health. The successful candidate will have an opportunity to gain administrative experience in all branches of the Public Health Service, including Maternity and Child Welfare. Salary scale £1405–£55–£1625 p.a. Commencing salary within the scale will depend upon the medical officer's experience. Pension scheme (including Widows and Orphans); medical examination. The officer appointed will be required to devote his/her whole time to official duties and the appointment will be subject to 3 months' notice on either side.

Applications, with names of 3 persons to whom reference may be made, to be sent to the Medical Officer of Health, Council House, Birmingham, 3, not later than 25th April, 1958.

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications are invited for the temporary appointment of 3 Whole-time MEDICAL OFFICERS in the Maternity and Child Welfare Department to take holiday duty during the summer months, commencing early in May, 1958. The appointments are non-resident and the salary offered is at the rate of £20 2s. 9d. per week. Successful applicants expected to remain, if required, for a period of 6 months.

Application forms obtainable from the Medical Officer of Health, Council House, Birmingham, 3. Completed forms to be returned to him, with copies of 3 testimonials, not later than 16th April, 1958.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

BUCKINGHAMSHIRE. COUNTY OF BUCKINGHAMSHIRE. BOROUGH OF SLOUGH. Applications are invited from registered medical practitioners for the Whole-time joint appointment of DEPUTY MEDICAL OFFICER OF HEALTH for the Borough of Slough, AND ASSISTANT COUNTY MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER for the Buckinghamshire County Council. Salary within the scale of £1099 9s. 5d.–£1515 9s. 11d. Travelling and subsistence allowances will be paid on the appropriate scale. The appointment is superannuable and subject to medical examination.

Further particulars and forms of application may be obtained from the County Medical Officer, County Offices, Aylesbury, to whom completed applications must be delivered by 24th April, 1958.

R. E. MILLARD,
Clerk of the Buckinghamshire County Council.

March, 1958. N. T. BERRY, Town Clerk, Slough.

COVENTRY CORPORATION require School Medical OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH (joint post) for duties connected with medical inspection and clinic treatment of schoolchildren, maternity and child welfare work, and such other duties as the Medical Officer of Health and Principal School Medical Officer may include from time to time. Qualifications/experience in ascertainment of handicapped pupils an advantage. Salary £1050–£1475. Commencing salary according to experience/qualifications. Removal loan available.

Application forms, &c., from Medical Officer of Health, New Council Offices, Coventry, returnable without delay.

HALIFAX. COUNTY BOROUGH OF HALIFAX. Applications are invited from duly qualified medical practitioners possessing the D.P.H. for the full-time appointment of MEDICAL OFFICER OF HEALTH. The salary will be £1850 rising to £2120 p.a., and the successful applicant will not be allowed to engage in private practice.

Full particulars are available from the undersigned. Closing date for applications 28th April, 1958.

RICHARD DE Z. HALL, Town Clerk.

Town Hall, Halifax, 1st April, 1958.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MEDICAL OFFICER (whole-time) required initially in Area 6 (Wembley and Willesden). Duties include supervision of health of mothers, young children, and schoolchildren. Experience in these branches of public-health work an advantage. Salary £1050–£50 (3)–£55 (5)–£1475 p.a. Established, pensionable, subject to medical assessment. Prescribed conditions.

Apply, stating age, qualifications, experience, and names and addresses of 2 referees, to Joint Area Medical Officer, 215, Chevening-road, Kilburn, N.W.6, by 30th April (quote X.238L). Canvassing disqualifies.

NAVY, ARMY AND AIR FORCE INSTITUTES. Applications are invited from general practitioners in the undernoted towns for the appointment in a part-time capacity as MEDICAL OFFICERS to this Corporation. Successful applicants would be required to examine and report on the condition of the employees of the Corporation who may be referred to them from time to time. Fees for this work will be paid on a scale agreed with the British Medical Association.

Applications, giving details of qualifications and experience, should be sent to the Chief Medical Officer, Navy, Army and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 26th April, 1958.

The towns for which applications are invited are:—

CHIPPENHAM	BRISTOL	TAUNTON
YEOVIL	EXETER	MINEHEAD

MEDICAL OFFICERS

THE UNITED KINGDOM ATOMIC ENERGY AUTHORITY,
INDUSTRIAL GROUP,

requires

MEDICAL OFFICERS

at its establishment in the North of England and in Scotland.

There is, as yet, no special qualification in radiological protection, but qualifications or experience in any of the following will be an advantage:

Industrial Medicine
Radiology
Pure Science

The field of health and safety in atomic energy offers good career prospects to those who wish to specialise in either industrial medical practice or the broader aspects of radiological protection, including health physics. The Authority will provide a certain amount of initial training and it is expected that, in due course, there will be a formal training scheme which will lead to specialisation in radiological protection. Candidates for these advanced courses will normally be selected from the Medical Officers in post.

The upper salary limit for these posts is £2400.

The posts are permanent and pensionable. Housing will be available, if required.

Write, in confidence, to

Director of Personnel and Administration,
United Kingdom Atomic Energy Authority,
Industrial Group Headquarters,
Risley, Warrington, Lancashire.

Please quote reference 2370.

* Medically qualified candidates who have applied against the recent general advertisement for Health and Safety staff will be automatically considered for these posts.

WALSALL. COUNTY BOROUGH OF WALSALL. Applications are invited from registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH. Salary scale £1050–£1475 p.a. The commencing salary will be decided according to qualifications and experience. Possession of the D.P.H. or D.C.H. will be considered an advantage.

Further particulars and application forms may be obtained from me. W. STALEY BROOKES, Town Clerk.

Council House, Walsall.

WARWICKSHIRE COUNTY COUNCIL AND BOROUGH OF NUNEATON, BEDWORTH URBAN DISTRICT AND ATHERSTONE RURAL DISTRICT. ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH AND DEPUTY MEDICAL OFFICER OF HEALTH. Applications are invited from duly qualified medical practitioners for the post of Assistant County Medical Officer of Health with the Warwickshire County Council, and the successful candidate will also be appointed Deputy Medical Officer of Health for the Borough of Nuneaton, the Bedworth Urban District, and the Atherstone Rural District, which posts together constitute a whole-time appointment, the time being allocated equally between County Council and County District Council duties. The officer appointed must hold the Diploma in Public Health. The aggregate salary will be £1396 5s. p.a., rising to a maximum of £1796 17s. 6d. p.a. Consideration will be given to the granting of financial assistance towards removal expenses.

Conditions of appointment and forms of application may be obtained from the County Medical Officer of Health, Shire Hall, Warwick, by whom completed forms of application must be received not later than 26th April, 1958.

L. EDGAR STEPHENS,
Clerk of the County Council.
A. A. CRABTREE,
Town Clerk, Nuneaton.
S. G. DEEMING,
Clerk of the Bedworth Urban District Council.
G. CARLYON MAY,
Clerk of the Atherstone Rural District Council.

Shire Hall, Warwick, March, 1958.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Vacancy for BACTERIOLOGIST under the Board of Public Assistance for the South Cork Public Assistance District. Essential qualifications include the M.D., M.Sc., D.Sc., M.R.C.P.I. or equivalent. Upper age limit: 50 years with extensions in certain cases. Salary scale: £1608–£1821. The person appointed may undertake, if offered, a University teaching appointment.

Application forms and further particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms: 5 P.M. on 25th April, 1958.

CITY COUNCIL OF NAIROBI. Appointment of Medical SUPERINTENDENT, African Maternity Hospital, Public Health Department. Applications are invited from experienced doctors for this permanent established post. Consolidated salary scale £1879–£60–£2239 p.a. Free unfurnished quarters will be provided. The Hospital has 72 Beds for African maternity cases. A European matron and 5 European sisters are employed and there are 40 trainee midwives. The Medical Superintendent will be in full charge of the hospital, will have to lecture to midwives, organise their training and take an active interest in their social welfare. Postgraduate qualifications are not essential. The clinical material is very varied and the post offers interesting prospects for a person with considerable experience of and an interest in obstetrics. The successful applicant must pass a medical examination before appointment.

Applications on forms available from the East African Office, Grand Buildings, Trafalgar-square, London, W.C.2, should reach the Establishment Officer, P.O. Box 30037, Nairobi, Kenya, by 10th May, 1958. Canvassing either directly or indirectly will be a disqualification. HAROLD AYREY, Town Clerk.

City Hall, P.O. Box 30075, Nairobi, 24th March, 1958.

GOVERNMENT OF MAURITIUS. Assistant Radiologist required for therapeutic and diagnostic work and other duties as required. Candidates must have qualifications registrable in United Kingdom; experience in radiodiagnosis an added recommendation. Appointment on contract for 3 years with gratuity (taxable) £50 a quarter payable on satisfactory completion of contract. Salary scale Rs. 14,520 (£1089) to Rs. 24,720 (£1854) a year, entry point dependent on qualifications and experience. Officers not allocated Government quarters may be reimbursed difference between approved rent paid for a furnished private house (subject to a maximum of Rs. 300 (£22 10s.) a month) and the 10% of salary normally paid for a Government house. Income-tax at local rates. Free passages for officer, wife, and children not exceeding 5 persons in all. Generous leave.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD.117/52/016).

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

FINCHLEY. Applications invited for Vacancy occasioned by death of practitioner. List at present approximately 2000. "Intermediate" area. Premises will be available for purchase. Apply on Form E.C.16A before 19th April, 1958, to the Clerk, Middlesex Executive Council, North West House, 119/127, Marylebone-road, London, N.W.1.

LYDD, KENT. Applications invited for Vacancy (chiefly rural). List at present approximately 2300. Residence and surgery available. Apply on E.C.16A before 26th April, 1958, to—

F. E. MILES, Clerk, Kent and Canterbury Executive Council.
11, Station-road, Maidstone.

WIGTON, CUMBERLAND. Applications are invited for VACANCY (mixed Urban and Rural) owing to resignation of practitioner. List at 27th March, 1958–1700. Intermediate area. Residence and surgery available. Apply on Form E.C.16A by 25th April, 1958 to—

F. M. SMITH, Clerk to Cumberland Executive Council.
7, Chatsworth-square, Carlisle.

MID-DEVON. Applications are invited for a rural VACANCY (resignation). List at present approximately 1550 (dispensing). Applications on Form E.C.16A should reach the undersigned not later than first post 19th April, 1958. House and surgery available for purchase. Form E.C.16A and further details obtainable on request.

H. BELL, Clerk, Devon and Exeter Executive Council.
46, Queen-street, Exeter.

URBAN DISTRICT OF MERTON AND MORDEN (Merton Park). Applications invited for VACANCY which will arise on 5th July, 1958, in above Urban District (intermediate). List at present about 1850. Retiring doctor's residence and surgery available on lease.

Applications on form E.C.16A to reach the undersigned not later than 23rd April, 1958.

Surrey Executive Council, S. H. BENNETT,
187, Ewell-road, Surbiton, Surrey. Clerk of the Council.

Required, Trainee Assistant rural group practice. Cottage Hospital.—Apply, Surgery, Alford, Lincs.

Required, Locum for rural group practice for 16th May–1st June, and 7th June–13th June. Car essential. Usual terms. —Surgery, Alford, Lincs.

Miscellaneous

Medical Officer required by Parkinson Howard Ltd., Civil engineering contractors for Tema Harbour, Ghana, West Africa. Modern hospital (70 Beds), first-class facilities and equipment. Applicants should be of Registrar status and have had surgical experience. 18-month tours and 3 months' paid home leave. Free married accommodation, salary £2200 p.a. Write full particulars to Personnel Manager, 13, Buckingham-gate, London, S.W.1.

PHILIPS ELECTRICAL LTD.

has a vacancy for an

INDUSTRIAL MEDICAL OFFICER on the staff of the London Headquarters, responsible to the Managing Director. Duties will cover the medical examination of staff and advice on health matters at Headquarters offices and 3 of the smaller London factories. He will have a special advisory function in regard to employment in clerical, administrative, and commercial occupations.

Salary will be in accordance with the B.M.A. recommendations for such posts, with pension and life assurance cover.

Applications from qualified men with some experience, stating age, qualifications and career details, should be sent to Personnel Officer, Philips Electrical Ltd., Century House, Shaftesbury-avenue, London, W.C.2.

SURGEON

Large Oil Company requires a Surgeon for work in the Middle East. Applicants should be qualified medical practitioners and possess F.R.C.S. or equivalent higher qualification. The man selected will work under the general direction of the present Surgeon and will be required to conduct surgical outpatient clinics at Consultant level. He must be capable of taking full control of all the emergency surgical and obstetrical cases during his tours of emergency duty which will normally be every other week. Service is on 3-year (renewable) contracts with pensionable pay not less than £1875 and substantial local currency allowances. Home leave with paid passages after 2 years. Fully furnished air-conditioned accommodation provided at nominal rental. Write in detail, quoting No. 810, to Box No. 1619, c/o Charles Barker & Sons, Ltd., Gateway House, London, E.C.4.

MEDICAL OFFICER

required for Middle East service by large Oil Company; preference for those with overseas experience and some knowledge of tropcial work. Surgical experience an advantage. Age about 35 and preferably single. Emoluments total at least £2250–£2350 p.a.; paid home leave after 2 years; pension fund; fully furnished air-conditioned accommodation provided at nominal rental. Please reply in detail quoting No. 784, to Box No. 1633, c/o Charles Barker and Sons Ltd., Gateway House, London, E.C.4.

Pregnancy Diagnosis (Fee 21s.). Specimens of urine accepted for testing (Hogben test) from doctors, hospitals and clinics anywhere. Results available within 24 hours. Fee reduced for hospitals and clinics. Telephone or write for details: FAMILY PLANNING ASSOCIATION, 64, Sloane-street, London, S.W.1. SLOane 0451 or 9112.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 98, Victoria-street, S.W.1 (VIC. 0141), who are specialists.

Shorthand Typist, considerable medical knowledge, requires 1 or 2 evenings work weekly. Liverpool area.—Address No. 389, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

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what is a TONIC?

NEARLY EVERY PHYSICIAN prescribing a tonic today thinks first in terms of either iron or vitamins. Or both; because the efficacy of iron depends so much on the vitamins linked with its absorption.

Foremost of these are ascorbic acid and the factors of the vitamin B complex.

All these are presented with easily assimilable ferrous iron in a single tablet of Ferraplex B.

Ferraplex B tablets are easily swallowed and well tolerated. They provide a complete iron haematinic therapy for convalescents, adolescents, pregnant women and patients with all degrees of iron deficiency anaemia.

COMPOSITION

Average daily dose of six FERRAPLEX B *tablets contains:*

Ferri Sulph. Exsicc., B.P.	1 gramme
Copper Carbonate	2 mg.
Ascorbic Acid (Vitamin C)	50 mg.
NATURAL VITAMIN B COMPLEX EXTRACT.	2 grammes

prepared from brewers' yeast and including

Aneurine hydrochloride (Vitamin B_1)	3 mg.
Riboflavine (Vitamin B_2)	6 mg.
Nicotinamide	30 mg.

and all the other naturally occurring factors of the vitamin B complex.

FERRAPLEX B

COMPLETE, ACCEPTABLE

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THE PROBLEM
To obtain high blood levels of theophylline easily . . .

For oral aminophylline therapy to be fully effective it is necessary to give a dose sufficient to produce high blood theophylline levels. However, because of gastric irritation vomiting often results. Alternative therapy with enteric coated tablets or suppositories is unreliable, and parenteral aminophylline is inconvenient.

THE SOLUTION
Oral 'Theodrox' . . .

The combination of dried aluminium hydroxide gel and aminophylline in 'Theodrox' ensures full therapeutic response with the minimum of gastric upset. Reproduceable blood levels comparable with those obtained from intramuscular injection can be obtained.

THE RESULT
A full Therapeutic response . . .

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REGD.

Recent work[1,2] has shown that synthetic derivatives of theophylline are mostly unsatisfactory and all are more expensive.

Each 'Theodrox' tablet contains 3 grains aminophylline and 4 grains dried aluminium hydroxide gel. 'Theodrox' is also available combined with ⅛ grain phenobarbitone where a degree of sedation is also required.

REFERENCES

1. *Brit. Med. J.* (1957) *2*: 67
2. *Ibid.*, page 74

DOSAGE . . .

ASTHMA:— two tablets, repeated in 2-3 hours if necessary to control paroxysm and dyspnœa. For prophylaxis, one tablet 4 times daily.

DIURETIC:— two tablets initially, then one or two tablets three times daily.

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PACKS:— Bottles of 25, 100 and 1,000 tablets.

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